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A Review of Federal Domestic Plant Quarantines

JOSEPH F. SPEARS 1913 - /

Animal and Plant Health Inspection Service
United States Department of Agriculture
Hyattsville, Maryland
January 1974

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PREFACE

The Federal plant quarantine system in this country is a little over 60 years old. The objectives of the plant quarantine system are to prevent the introduction or spread of a pest or disease. It is achieved by legal restrictions on the movement of commodities for the purpose of preventing or inhibiting the establishment of plant pests and diseases in areas where they are not known to occur.

The establishment of plant quarantine measures should rest on the following fundamental prerequisites: (1) The pest must offer an actual and expected threat to large interests; (2) no substitute action, less disruptive of normal trade, is available; (3) the objectives must be reasonably possible to attain, and (4) the economic gains from pest control must outweigh the costs of administration and interference with the normal trade activities.

Quarantines must keep current with plant protection practices. These practices change as biological controls, pesticides, host varieties, and cultural methods change. This also applies to the basic laws that authorize quarantines, as well as the rules and regulations pertaining to quarantines. In short, plant quarantines should be a dynamic functional tool of plant protection.

Modifications of quarantines should proceed as fast as establishing quarantines. This requires constant awareness of changing conditions. Repeal must be considered when a quarantine objective is reached. If an objective cannot be accomplished, then the matter should be reviewed with repeal or other measures in mind. This, again, reflects the dynamic goals of the quarantine.

In 1931, the National Plant Board felt that the objectives of domestic plant quarantines should be clearly defined. They adopted "The Principles of Plant Quarantines" which define a quarantine as:

"... a restriction, imposed by duly constituted authorities, whereby the production, movement or existence of plants, plant products, animals, animal products, or any other article or material, or the normal activity of persons, is brought under regulation, in order that the introduction or spread of a pest already introduced may be controlled or eradicated, thereby reducing or avoiding losses that would otherwise occur through damage done by the pest or through a continuing of control measures." (Appendix I).

These Principles were supplemented with a set of basic definitions and general guidelines to be considered in preparing quarantines and supporting documents to promote greater uniformity in plant quarantine action throughout the country. These guidelines were adopted by the National Plant Board in 1969 (Appendix II).

The "Principles of Plant Pest Control" were defined by the National Plant Board and adopted August 1972 (Appendix III).

The procedures, philosophies, and approaches to Federal plant quarantines were formulated during the 1920's and 1930's. The activities of individuals and societies are oriented toward various fundamental objectives which may be postulated as: Services, material goods, health, comfort, leisure, aesthetic satisfaction, opportunity for recreation, and stability of existence. Quarantines must be considered in relation to these basic objectives, and individual desires must be reconciled with those of other members of the society. The major difficulty in judging the desirability of a particular quarantine is the conflicting objectives of the people concerned.

An organism becomes a pest only when it interferes with the achievement of one or more of the above. Plant protection is a means of progressing toward the basic objectives of individuals and societies, and quarantines are one aspect of plant protection.

During the past five decades, technological advancements have significantly increased man's ability to move himself and his possessions ever greater distances in ever decreasing amounts of time. Technological advancements have also greatly increased man's ability to undertake plant and animal protection programs on a scale and scope previously unimagined. With the development of modern pesticides, which first appeared in the 1940's, man began to realize the magnitude of the harvest taken by pests. The use of modern pesticides is one of the most economical means of obtaining the highest degree of plant protection. The secondary effects of pesticides have only recently been recognized, and their full effect remains to be disclosed through more refined and sophisticated research. Concerns with environmental or secondary effects, however, are forcing the abandonment of certain pesticides, and there is growing concern about man's continuing ability to deal effectively with both the new pests, as well as the long-established ones.

In response to the growing restrictions on pesticide use, a growth in the development of integrated pest control has occurred. Integrated control is the use of two or more pest control techniques (pesticides, cultivation, crop rotation, etc.) in concert to achieve an acceptable level of plant protection. Integrated control represents a fundamental change from "pest control" to "pest management." Today, there is a growing recognition among agricultural leaders that the benefits of integrated control will not be fully realized without the active participation and leadership of the Federal Government.

Plant protection involves costs as well as benefits. The benefits of plant protection and quarantines are gains or maintenance of services and material goods or some other fundamental goal. The costs of plant protection are the things sacrificed to obtain the desired protection. Benefits are usually the gains toward certain goals, while costs are the sacrifices of these or other goals. If a pest threatens man's crops or material goods, the benefits are usually the losses prevented rather than the gains obtained. The problem of evaluating quarantines lies in determining whether the total results will be a net gain or loss in terms of all the relevant fundamental goals.

During this past decade, there has been a growing effort to develop integrated pest management programs. These programs are designed to integrate new research

findings with practical pest control activities. In this effort, the Animal and Plant Health Inspection Service (APHIS), has been assigned a leadership role in the areas of survey and data collection, environmental monitoring, safety, and regulatory activities. Supporting research remains with scientists of the Agricultural Research Service and the Cooperative State Research Service. To achieve effective pest management, close communication is needed between regulatory personnel and the research scientists.

Technical advances and organizational changes make it imperative that plant protection programs be examined periodically to clearly discern Agency strengths, capabilities, and weaknesses. Quarantines, as a part of plant protection, must keep up with changing conditions to realize the maximum benefits.

Recognizing the impact of technological advances, conflicting interests, and administrative changes, the Deputy Administrator for Plant Protection and Quarantine Programs (PPQ), APHIS, initiated an indepth review of plant quarantines. This review was conducted around three facets.

1. Review of the Plant Quarantine Act, the Organic Act, the Federal Plant Pest Act, and other authorizing legislation to determine if these authorities are adequate or whether changes are needed.
2. Review all Federal domestic plant quarantines and regulatory guidelines relating thereto, including: (a) Compliance agreements, (b) certificates and permits, (c) regulated articles, (d) emergency regulations and hold orders, (e) provisions for exempting articles, (f) conditions governing the movement of regulated articles, (g) transit inspection, (h) regulated areas, and (i) quarantine violations.
3. Interview select members of the scientific community, including heads of departments, directors of research, directors of experiment stations, and directors of extension, State commissioners and secretaries of agriculture, State regulatory officials, and industry personnel, to obtain their views and approaches to plant regulatory activities.

ACKNOWLEDGMENT

This report on domestic plant quarantines was prepared during the period February-July 1973. During that period, I have traveled to 15 States and visited over 50 scientists, regulatory officials, secretaries and commissioners of agriculture, and industry representatives seeking their views and recommendations for changes in domestic plant quarantines. I wish to thank all these people for their courtesy and hospitality.

In order to review each individual quarantine, special study groups were formed with those people most intimately associated with the day-to-day field administration of domestic plant quarantines. The chairman of each study group was free to conduct his review of the assigned quarantine in any way he saw fit. In all cases, the views of a large number of people closely associated with the program were solicited. They included Federal inspectors, State personnel, representatives of industry, and research scientists.

The study groups and their members were:

Barberry Eradication

W. Ring (chairman), Montana
E. Stubbs, Pennsylvania
F. Ketner, Texas

Japanese Beetle

S. McNally (chairman), New Jersey
W. Lott, North Carolina
H. Smith, Michigan

Cereal Leaf Beetle

J. Hayward (chairman), Minnesota
B. McClung, Illinois
R. Moore, Michigan

Mexican Fruit Fly

T. Kinsey (chairman), Louisiana
G. Burgess, Texas
J. Locklar, Texas

Golden Nematode

V. Lafleur (chairman), Massachusetts
R. Gaines, New York
E. Richman, New York
W. Brown, New York (State employee)

Pink Bollworm

D. Petty, Maryland
E. Crooks, Maryland

Gypsy Moth

E. Eckess (chairman), Pennsylvania
W. Stagner, Tennessee
R. Godin, Connecticut

G. Dyson (chairman), California
E. Jackson, Texas
H. Bryan, Washington

Quarantine 13

Imported Fire Ant

T. Lanier (chairman), Georgia
C. Hall, Florida
T. Pigott, Alabama

H. Bowman (chairman), Florida
C. Gaddis, Florida
E. Ayers, Puerto Rico
F. Rodriguez, Puerto Rico

Whitefringed Beetle

R. Milam (chairman), Alabama
T. Gilliland, Florida
H. Smith, Virginia

Witchweed

B. Granberry (chairman), North Carolina
B. Lee, North Carolina
Q. Chapman, South Carolina

Legislative Review Committee

H Ivan Rainwater (chairman), Maryland
H. Autry, Maryland
E. Crooks, Maryland

The study groups' reports are indepth discussions of the domestic plant quarantines and are too voluminous to be included in total in this report. However, summaries of the groups' recommendations are included herein. Complete copies of each study group's report are available for study and review, upon request.

I am also indebted to Mr. C. E. Carlson for special project work on transit inspection, Mr. P. M. Schroeder for library research, Drs. R. J. Daum and B. Levy for technical assistance, and to the chief staff officers for their review of the study groups' reports. I also wish to acknowledge the assistance of Mr. C. C. Fancher for his advice and counsel in the preparation of this report.

Others have contributed to this report in various ways, and I am sincerely grateful to all for the time and effort devoted to special assignments.

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A REVIEW OF FEDERAL DOMESTIC PLANT QUARANTINES

INTRODUCTION

Any activity that has an impact on man's values will always be in a state of change and is apt to be controversial. This has been particularly true in recent years as man becomes increasingly concerned about his relationship to the environment.

Federal plant quarantines have a great impact on man and his environment if they restrict his activity or if they in some way impair the natural state of things. It should come as no great surprise that there is no unanimous agreement as to the value of plant quarantines. Some people believe and subscribe to the theory that plant pests, under any and all circumstances, will seek their natural level. This group subscribes to the theory that natural controls should be allowed to prevail; artificial restraints should not be imposed. Others question the value of plant quarantines because, they say, in many cases it is almost impossible to prove with scientific evidence that quarantines are effective.

The problems of plant quarantine in the 1970's do not differ conceptually with those of other disciplines in our society. We are in a period of change--decreasing budgets, genuine concerns about the environment, the greater influences of powerful interest groups, and changing management styles. As a Federal Agency we are affected by these changes, particularly the relationship between the two branches of our Government--the legislative and executive. These changes will act and interact with the central concern of plant quarantine--to deter the artificial spread of agricultural pests. In this changing environment, the public expects management to do an effective job. It is not enough to justify program actions based on consensus of opinion; nor is it sufficient to demonstrate public or congressional support. These conflicting concerns and objectives must be handled in perspective.

Effectiveness of plant quarantines has largely been based on negative information. If a pest was held in check, the quarantine was considered successful. However, other factors should be considered. A prerequisite in the determination of effectiveness is the establishment of suitable measures. The traditional measure of effectiveness is economic, i.e., the value of the crops protected against the cost of carrying out the program. Other measures may be: (1) The effects of pests against the effects of control measures on public health, (2) the effects of pests against those of control procedures on wildlife, air, and water, and (3) the effects of quarantines on the free movement of people and commodities.

Establishing the effects of quarantines by these measures is difficult. Correlative studies are not acceptable evidence. The fact that an infestation spreads more slowly coincident with the establishment of a quarantine is not

in itself evidence of causality. Such inferences require careful design of the procedures under which observations are made. Haphazard observations are often worse than none at all, while systematic observations can often eliminate the effects of chance occurrences.

The effectiveness of a quarantine cannot be measured without a control, i.e., without dropping the quarantine at certain locations at certain times. If such control is undesirable or impractical, then one can only monitor the spread of the pest and presume the rate of spread is related to quarantine effectiveness. This is the crux of the problem and the condition that most often prevails.

The effort needed to overcome the problems in measuring effectiveness is great. Each pest or group of pests represents a separate problem. Just as biology dictates methodology, biology also is a constraint in determining the impact of the pest and the measure of quarantine effectiveness. This dictates measuring the effectiveness of quarantine on a case-by-case basis.

No one has really tackled the problem of proving how effective plant quarantines are. I believe that sufficient evidence could be secured to measure the effectiveness of plant quarantines. I find overwhelming support for the use of domestic plant quarantines now and in the future as a valid means of dealing with plant pest problems. As man becomes more mobile and as world trade expands, plant quarantines will correspondingly play a greater part in the agricultural economy. However, plant quarantines are going to have to be justified on a system analyses basis. Plant quarantines have to be evaluated on more than a biological basis. To be sound, not only must their objectives be reasonably probable of attainment from a biological standpoint, but they must be economically justifiable as well.

Following World War II, there was rapid growth in plant quarantine work which most likely resulted from man's increasing ability to move himself and his possessions greater distances in shorter spans of time. This increase in quarantine work was accompanied by no significant changes in procedures. Changes in regulatory or quarantine procedures have now become paramount primarily because of significant changes in man's activities and his changing values. Changes in the future in quarantine procedures can best be accomplished through a fundamental approach. A fundamental approach would first examine the purpose of the plant quarantine and then carefully construct this purpose as a clearly stated objective.

From an economic point of view, the purpose of plant quarantines is to reduce losses from certain plant pests. To achieve the objective of reducing losses through plant quarantines, it is necessary to first clearly establish two reference points: (1) What degree of reduction of losses do we wish to achieve, and (2) what amount of resources could we expect to be available for the plant quarantine problem.

This economic approach, therefore, requires a careful assessment of likely losses with quarantines and also likely losses without Federal plant quarantines. The next question is what are the most effective ways of reducing

losses through plant quarantines and to what extent losses can be mitigated by the Federal quarantine. Answers to these questions will be divergent owing to the different objectives of the people affected. Advice on this question should be sought and carefully weighed from the most objective groups and from many other sources.

REPORTS

Historical background

Alien plant pests, brought to the United States with agricultural items and other materials, cause damage to our farms, forests, and gardens, estimated in the billions of dollars.

Many of the pests are not dangerous to their native environment because diseases, natural predators, and parasites keep them in check. However, when introduced to a new area without their biological controls, pests can multiply rapidly and spread. Pests scatter naturally on their own power and with the breezes. Long-distance spread is artificially produced by man moving infested articles and host materials from one section of the country to another.

Federal plant quarantine regulations are authorized by acts of Congress to prevent the introduction and artificial spread of foreign pests, including insects, nematodes, snails, and diseases.

The Plant Protection and Quarantine Programs of the Animal and Plant Health Inspection Service, U.S. Department of Agriculture (USDA), acting for the Secretary of Agriculture, has the major responsibility for enforcing these Federal plant quarantine regulations.

Pest damage is a serious threat to our plant life. It directly or indirectly affects every person in this nation--in their livelihood, in recreational activities, and in food supply.

Originally, "quarantine" meant "40." It referred to the period of 40 days during which a ship arriving in port and suspected of carrying contagious human disease was detained. The ship's crew and passengers had to stay on board during the quarantine period to permit latent cases of disease, such as bubonic plague, cholera, and yellow fever, to develop. Exposed persons were not permitted to land.

Gradually, the time significance of "quarantine" disappeared, and the word came to refer only to the detention feature and the practices connected with it. Then the word "quarantine" carried over from its application to human disease to animal disease and, later, to diseases of farm and horticultural crops. In all cases of quarantine--human, animal, and plant--a public authority legally sets up barriers against spreading injurious pests and diseases.

Although agriculture has been plagued by insects and diseases all through the ages, the plan of protecting plants and crops by quarantine action is comparatively recent. Early plant growers were hopelessly and helplessly resigned to their fate. Then, as they gained reliable information and better agricultural techniques, individual farmers began to attack the pest problem with some success.

However, it was only with advanced scientific discoveries and the urgency of the pest problem that governments started large-scale suppression programs.

In the early days of agricultural development in this and other countries, plants and plant products were brought into and sent out of the country with little or no thought concerning insect pests and plant diseases that might be transported along with them. It is only since the middle of the last century that any really serious attempt at legislation to restrict the spread of plant pests has been attempted.

The introduction of a grape disease from America to the vineyards of France about 1860 focused attention on the problem of unrestricted movement of agricultural products and the need for some type of regulatory action. In 1881, representatives of many European countries met and agreed on establishing restrictive regulations on the movement of infested grape stalks.

The spread of certain plant pests in the United States in the latter part of the 1800's stimulated the passage of legislation that restricted the movement of commodities that might harbor plant pests in the country.

By the close of the century, almost every State had passed laws restricting movement of nursery stock. Even though most States had some type of regulations, the United States Government had not taken action. In fact, the United States was one of the last major powers in the world to enact national legislation to protect itself from alien plant pests.

In 1905, an act was passed by the Congress ". . . to prohibit importation or interstate transportation of plant pests." It was not until 1912 that the United States had adequate Federal legislation to restrict and control the entry of plants and plant products to the extent necessary to prevent the entry of plant pests.

At the time the Congress passed the Plant Quarantine Act of 1912, at least one-half of the injurious insects in this country were of foreign origin. These included the codling moth, the Hessian fly, the asparagus beetle, the hop-plant louse, the cabbage worm, and the wheat plant louse. Also, imported plant diseases--such as the cabbage black-leg, asparagus rust, and European apple canker--threatened domestic crops. Altogether, alien plant insects and diseases, introduced prior to 1912, were causing a loss in farm products estimated at \$1 billion annually.

However, the final incentive for securing better Federal legislation to protect our plants was the heavy infestations of browntail moth and gypsy moth in New England. In 1909, a bill to fight foreign pests was introduced. After

about 4 years of hearings and several amendments to the bill, the Plant Quarantine Act became law on August 20, 1912. Since 1912, six amendments have extended the scope of the Plant Quarantine Act. This act authorized the Secretary of Agriculture to regulate the importation and interstate movement of plant materials that might be hosts to both insect and disease pests. Under this act, 45 domestic quarantines have been imposed, of which 10 are still in effect. The others were revoked for various reasons--the pest in question was eradicated, certain problems could be solved by State action, or the quarantine was useless because the pest was too widespread.

Other acts affecting plant quarantines are: The Mexican Border Act of 1942, the Organic Act of 1944, the Golden Nematode Act of 1948, and the Federal Plant Pest Act of 1957.

The latter act superseded the Insect Pest Act of 1905 and supplemented the Plant Quarantine Act of 1912. It broadens the definition of a plant pest to include any invertebrate animal or an organism that can directly or indirectly injure or cause disease in plants. It also includes as pest carriers, any article or means of conveyance. Other provisions of this act give authority for emergency action and for issuing regulations necessary to prevent pest spread.

The subject of Federal legislation will be dealt with in more detail in a later chapter.

Introduction versus establishment of a pest

History indicates that quarantine officials have not fully considered how difficult it may be for a plant pest to establish itself in a new location. The ease or difficulty of an insect pest or plant disease becoming established in a new area has an important bearing on the promulgation and enforcement of plant quarantines.

"Introduction" is the entrance of a plant pest into an area where it has not previously existed, while "establishment" is the colonization of an insect, plant disease, or nematode. This distinction is important for it has direct bearing upon the articles to be placed under regulation.

The apparent philosophy of plant quarantine is to place a fence around an infested area and allow nothing to move out without some assurance that the commodity is pest free (i.e., requiring permits, certificates, or commodity treatments). Thus, the same emphasis is placed on a "high" risk item as on a "low" risk item.

Most scientists think it is ordinarily difficult for a plant pest to become established in a new area. However, a complicated set of circumstances and conditions must exist for establishment to take place:

1. Introduction must occur in the immediate vicinity of a host plant.

2. Introduction of a pest which requires alternate hosts must occur where both hosts appear in proper sequence.

3. Introduction must coincide with the reproductive cycle of the host. Insects that attack fruit, for instance, must arrive during the fruiting season.

4. The narrower the pest's host range, the less likely it will become established.

5. The pest, upon arrival in a new location, must be physiologically sound. Unless it is already gravid, the female must find a mate. Introduction of adults usually requires sufficient numbers to assure a meeting of the sexes.

6. The pest must arrive in sufficient numbers to allow for attrition from environmental factors and to establish a gene pool to permit adaption to new environments.

Low numbers of insects carried on commodities constitute minimum hazard as judged by most scientists. The experiences of these scientists to establish parasites, predators, and beneficial insects, purposely introduced into a new environment, are exasperating and require repeated introductions with large numbers of individuals. If intentional introduction where conditions are ideal often fail to result in establishment, how much more frequently must this be true in the case of accidental or haphazard introductions? Dr. Charles Elton (1927), an animal ecologist, discusses the question of introduction and establishment in the following words:

"When such an animal (i.e., one reaching a new habitat) reaches its destination it may either die or survive. It usually dies; but, if it does not, we say that it has 'established itself as an individual.' . . . But in such cases the individuals are unable to breed successfully, or else the young are unable to survive. The next state is, therefore, that the animal must 'establish itself as a species.' It does this if it is successful in breeding and starting a permanent population of its kind. Frequently a species may reach some new place and breed, and may establish itself for a short time but is then wiped out. This often happens because the animal is not adapted to some periodic factor which acts at fairly long intervals, e.g., a very bad winter or an epidemic. Or the species may die out simply because its numbers and rate of increase are not suitably adjusted to the new environment in which it finds itself. For instance, after big invasions of sand grouse or of cross-bills, pairs of birds have been known to breed in some localities for a year or two after their first appearance. But they usually die out in the end and no more are seen until the next invasion. It is plain that an enormous wastage must occur while the establishing after introduction is taking place, and that only a tiny fraction of the original immigrants will ever succeed in establishing itself even temporarily."

Dr. H. S. Smith (1933) of the University of California states the following:

"That introductions so often fail to result in establishment is undoubtedly a matter of fundamental importance in plant quarantine. If every introduction of a plant pest or disease or even a large portion of them resulted in establishment, there would be practically no field for plant quarantines, for it is manifestly a practical impossibility in most instances to prevent every introduction by legal restrictions. Nevertheless, recognition of this fact immediately indicates that the use of quarantines for preventing the establishment of plant pests and diseases in areas where they have not formerly occurred may be a logical and reasonable procedure. The Mediterranean fruit fly has been intercepted hundreds of times at California ports, and it would be unreasonable to suppose that all introductions have been intercepted. There seems little doubt but that failure of the fruit fly to become established in California up to the present time is explained by the fact that a complicated set of biological requirements must be met before such introductions can result in establishment. But if such introductions happen frequently enough, sooner or later the right combination of circumstances is likely to occur, and establishment will then result. It is the function of plant quarantine to make these introductions so infrequent, so scattered, and so infinitely small that establishment will be greatly deferred or prevented altogether. It is concluded, therefore, that plant quarantines do not necessarily have to result in the interception of every individual of an insect or pathogenic organism in order to be effective and justifiable."

Complexity of regulatory programs in the environment

Historians may well call the past decade the years of the environmental movement. They certainly were the years which had great impact on pest control programs. Never before had public officials been so challenged concerning the usefulness and safety of organized pest control.

Ecologists may not be able to say that the past decade actually marked a significant change for the better in the quality of life--in less polluting and fouling of our land, water, and air, or in improved health, working conditions, and recreational opportunity. Indeed, in certain cases--such as air pollution--there may be evidence of worsening environmental conditions. Yet, the 1960's and 1970's marked the beginning of a new emphasis on the environment--a turning point--a period when quality of life has become more than a phrase. "Environment" and "pollution" have become everyday words and, to some, ecology has become almost a religion.

Environmental problems are not new. They have been with us for years on the threshold of national prominence. However, they have now been thrust to the center of national concern. Action to improve the environment has been

launched by government at all levels. Private groups, industry, and individuals have joined in the attack.

A striking shift has come about in recent years from a focus on single problems to a broad view of the interrelated elements of our environment. This has had, and will continue to have, an impact on how we attack future plant pest control activities. They are no longer launched without adequate review and supporting environmental impact statements.

The year 1973 represents a pivotal time in our battle for a clean environment. The nation is committing resources at all levels of government and in the private sector for a more acceptable approach for a clean environment. Public support for environmental programs is at an all-time high. It is not possible in many circumstances in regulatory and control programs to deal with modern-day pest control problems by the procedures followed only a few years ago.

What then is the outlook for the future? As we move into the 21st century, we must keep in mind that the need for pest control will increase instead of diminish. Authorities expect the population to double by the year 2000. In meeting future requirements for food, we must improve our methods of dealing with plant pests. We have good reason to believe that we can achieve this goal without undue hazards to man and his environment.

The days are gone when an administrator of plant protection programs can decide on his own to take an action independent of other organizations and interests. In today's world, he is going to have to justify on a scientific basis: (1) That the program is needed, (2) that it is economically justified, and (3) that in carrying out program operations, the side effects will not adversely affect the environment.

Perhaps no single event has had more impact on PPQ programs than the passage of the National Environmental Quality Act, Public Law 91-190 (1969), which established the Council on Environmental Quality in the Executive Office of the President. This act, among other things, requires that a detailed environmental impact statement be filed prior to starting any pest control program that may have a significant impact on the environment. The Council on Environmental Quality provides guidelines for preparing detailed environmental statements on major action programs. Underlining the preparation of such environmental statements is the mandate of both the act and Executive Order 11514 of March 5, 1970, that all Federal Agencies direct their policies, plans, and programs so as to meet national environmental goals to encourage productive and enjoyable harmony between man and his environment. The objective of the environmental impact statement is to build into the decision-making process appropriate and careful consideration of the impact any major program might have upon the environment. Guidelines set forth for implementing the provisions of the act provide for a time frame for issuing the environmental statement, prior to initiating any program. The act provides for a draft environmental impact statement which is circulated for comment to Federal, State, and local agencies and for information to the public. The final environmental impact statement should be responsive to comments received.

Following the formation of the Council on Environmental Quality, the Federal Working Group on Pest Management was formed (formerly the Working Group, Subcommittee on Pesticides, President's Cabinet Committee on the Environment, and, previous to this, the Federal Committee on Pest Control).

The principal functions and responsibilities of the Federal Working Group on Pest Management are to review annually Federal pest control programs to insure that the best control methods are used from an efficacy and environmental standpoint.

The Secretary of Agriculture's Memorandum No. 1788 dated July 26, 1972, established the Department's Pesticide Committee. The primary function of this committee is to coordinate the Department's interest and responsibilities with respect to the effect of pest control programs on the environment. The committee will review, evaluate, and recommend research, education, and information programs on pests and their control. Emphasis will be placed on the needs of adequately implementing pest control, regulatory, and quarantine programs.

Research needs in support of regulatory operations

One of the most important requirements in the field of regulatory operations lies in a close relationship with scientists conducting basic research, since practically all successful attacks of newly introduced plant pests represent the translation of special knowledge into field operations. Basic research is thus essential to support quarantine operations, as well as control practices.

When a new destructive crop pest occurs in this country, certain information about the biology and ecology of the pest or organism is needed quickly to initiate quarantine, regulatory, and control measures. In the absence of this basic information, there can be no sound judgment as to the proper course of action for stopping the pest.

When a pest introduction occurs, the situation takes on the character of an emergency and calls for a crash research effort. After action is initiated, continuing research is necessary to deal with problems as they arise.

Research to find needed answers on how to deal with newly introduced insects, plant diseases, and nematodes, falls within the authority and responsibility of the Agricultural Research Service (ARS) of USDA. The Animal and Plant Health Inspection Service does not have authority to undertake these types of investigations. APHIS does have authority to conduct methods development operations--applied research. The types of studies which normally fall into this category are intended to improve program operations. They are responsible for working out cheaper, simpler, or more effective treatments to lighten restrictions, simplify procedures, and, in general, save time and efforts in the interest of more economical operations.

With the establishment of APHIS as a new Agency, Administrators of ARS and APHIS recognized the need to clearly set forth procedures to insure continuation of timely and effective research to support APHIS programs. Administrators of the two Agencies entered into a formal agreement providing for program liaison. The agreement provides for an annual planning process to define APHIS research needs and to establish priorities. These needs are presented to ARS annually for consideration in light of overall research missions, goals, and available resources. Some of the old line regulatory programs have been supported by a great deal of organized research for many years. These include Japanese beetle, boll weevil, pink bollworm, fruit flies, and grasshoppers. Research which bears on the immediate problems of many programs is inadequate.

As I view the agreement entered into by the Administrators of ARS and APHIS, the key to ARS' ability to support APHIS regulatory programs is contained in one sentence that says, "APHIS research needs will be considered in line with ARS overall research missions, goals, and available resources." A clearer Department policy regarding the relationship between supporting research and plant regulatory operations is needed. If ARS does not have available resources to support APHIS regulatory programs, there will be a void in scientific investigations to support PPQ operations. It would, therefore, seem appropriate, in order to insure financial research support for APHIS programs, to work out an arrangement within the Department whereby each regulatory program line item in PPQ is supported by a line item in the ARS research budget.

The Cooperative State Research Service (CSRS) administers Federal grant funds for research in entomology, plant pathology, and other related agricultural sciences. Funds are made available to the State agricultural experiment stations and other designated State institutions. CSRS administers a cooperative grant program for basic and applied research. The technical staff of the Service provides leadership in planning and coordinating research and maintains cooperation by and between the stations and the Agricultural Research Service. Research conducted under CSRS' direction is oriented to State and regional problems. It is, therefore, proposed that ways and means be explored to utilize facilities and leadership of CSRS in providing research needs for PPQ that are of local and regional concern.

Relationships with scientific and academic communities

Scientific and academic communities throughout the nation have expressed a need for (1) closer ties with PPQ personnel working in their States, and (2) more indepth knowledge of domestic plant quarantine programs, goals, and objectives. This view is particularly strong among university and experiment station subject-matter personnel.

A few PPQ State Supervisors are on a first-name basis with their State's leading entomologists and scientists in similar quarantine-related disciplines. But, such cases are all too rare. For most PPQ supervisors, contacts with local scientific and academic leaders consist only of brief, impersonal encounters at meetings.

The work of PPQ and the understanding of its goals and objectives will be enhanced if more effort is made by personnel in leadership and management positions to become closer allied with subject-matter personnel in the scientific and academic community in each State. The future of plant protection work lies in bringing all disciplines together and working together on a common goal. We must strive to make all personnel concerned with program operations members of our team. We must seek the advice and counsel of the leaders in each State, including industry. We must have enough dialogue with these people so that they will understand our mission.

One State Supervisor, for example, has achieved considerable success in his scientific and academic relationships by issuing an annual report of PPQ operations in his State. The recommendation was made by some scientists that PPQ issue a "situation" report periodically or whenever major revisions in program operations occur. Such a report would serve as a means of informing and updating members of the scientific and academic community. Such a report would also be useful in keeping industry representatives abreast of program activities. The recommendation has also been made that the State and port supervisors hold an annual critique or program review with interested persons. Whatever format is used must be tailored to the individuals involved and their needs for information on technical aspects of PPQ programs. Since these scientific and academic contacts are highly respected in their States, it is essential that more effort be made to equip them with the facts.

Public information in support of plant quarantines

Domestic plant quarantine programs increasingly need broad public approval and support to achieve maximum success. For example, the public must understand and accept the reasons for the existence of a quarantine, so that they will voluntarily comply with quarantine restrictions. Regardless of the size of our field inspector network, we could not hope to stop a pest from spreading without such voluntary compliance.

The first requirement in winning voluntary compliance is to inform all who might be affected that a quarantine exists and to educate them on its provisions and restrictions. Next, the public must be kept up to date on changes in rules and regulated areas. Perhaps the hardest part is to convince the public that it is in their own best interest to comply with the quarantine.

In informing and educating the public, the PPQ inspector must augment the broad-scale efforts of the APHIS Information Division, especially in cooperating with his local media. This does not mean that he should actually write press releases; however, he should be capable of calling his local newspaper or TV station and giving them full, factual information about a quarantine change so they can write the story. Furthermore, all news media in a quarantine inspector's area should know that he is the local authority to call for information on domestic quarantine matters, and they should be furnished his name and telephone number for ready reference.

Extension agents are another channel for public information; they are frequently consulted as the local authority on all agriculturally related subjects. Also, many county agents have a farm radio or TV show or weekly newspaper column for communicating information directly to the public. PPQ inspectors might seek assistance from the Extension Service to reach the public but should not expect or request the county agent to assume this responsibility.

There's more to public information than merely telling people what's happening. For programs like domestic quarantines, it is essential that the information also moves people to act--i.e., comply with the quarantine. People react favorably when you demonstrate how and why such action will directly benefit them. It's simple enough to show the direct benefit of quarantines to farmers. Pests and diseases damage and destroy their crops and livestock, but it is not so simple to show direct benefits to the nonagricultural public.

One commonly used technique--though of questionable effectiveness--is to claim that if foreign pests and diseases enter the United States, they would reduce the availability of food and contribute to higher food prices. To the average urban citizen, this connection is too abstract and too general. Most nonfarmers will not be convinced that "swapping my one little plant" is going to "bring down the rafters" on the nation's food supply. Thus, it is generally more effective and more meaningful to average citizens to refer to specific cases to emphasize how--by keeping these foreign pests and diseases out--we are protecting their lawns and gardens, the value of their homesites, their ornamental fruit trees, and the beauty of their parks and playgrounds.

Above all else, information programs must be completely honest with their publics and with the media.

Good information programs do not just happen by accident. They are carefully planned to support quarantine operations. PPQ inspectors have a definite role in this process--both as a cooperater with the Information Division, and as a disseminator of truthful and useful information to the industry, the press, and the public.

Review of plant protection programs

During my conversations with members of the academic and scientific community representatives of industry, and State officials, I found of common concern the need for a more formalized review of plant protection programs and the need for establishing definite guidelines for getting in and out of programs. There has already been a review of PPQ by the Quarantine Criteria Work Group. Their report, entitled "Guidelines for Initiating and Discontinuing State-Federal Plant Protection Programs," is included in this report as Appendix IV.

All the scientists, industry representatives, and other officials I talked to agreed that once a federally funded program has been initiated, the program

should be closely monitored on a continuing basis to determine: (1) Whether it was meeting its goals and objectives, (2) when it reaches its peak of effectiveness, and (3) whether the benefits derived justified the cost of continuing the program. Such a program review would also make recommendations for changes in regulatory actions, survey, and control operations as new scientific evidence and changing times warranted. The mechanism for monitoring would be the formation of a small task force consisting of a program representative, State regulatory official(s) from the infested and non-infested States, a representative from ARS, and representative(s) from State experiment stations, or other appropriate State research agencies. Each PPQ program would have an indepth review by this select group in a 1- to 3-year basis.

This type of program review has been carried out in a highly successful manner on the khapra beetle and the golden nematode programs.

SURVEY AND DETECTION FOR REGULATORY PURPOSES

Insect surveys provide growers, industry, and interested State and Federal agencies with essential information about destructive and useful insects. This information concerns infestation levels, distribution, hosts, and damage caused by pests that attack or threaten crops, forests, ornamentals, livestock, and public health. In addition, information is provided on the occurrence, density, and usefulness of beneficial insects. Regulatory workers are thoroughly cognizant of the need for insect surveys of various kinds and the important part they play in providing information for intelligent and proper evaluation of new finds and the existing populations for the purpose of determining necessary control and regulatory action.

Many surveys are now being planned on a biometric basis. Supervisors responsible for survey operations should receive training on basic biometric concepts. Supervisors need to know the degree of confidence they can place in a given survey method for detecting an infestation of a given size and intensity. Before the survey begins, he must know how survey results will be evaluated. Otherwise, he cannot know how to collect data that will provide the information he needs to guide his program.

Detection and survey activities in Plant Protection and Quarantine fall into four broad categories: (1) The interception of exotic plant and animal pests moving in international commerce via cargoes, carriers, mail, stores, and baggage; (2) hazardous site trapping in the vicinity of international seaports and airports for early detection of foreign pests that may have penetrated our defenses; (3) the cooperative economic insect survey program conducted by numerous agricultural workers across the nation to provide current information on insect conditions in their localities; and (4) program surveys for ongoing programs. Program surveys, including detection, delimiting, and evaluation surveys, serve as a necessary aid in control and regulatory operations. Detection surveys identify new areas of spread. Delimiting surveys are used to define specific areas of pest occurrence. Surveys are

a necessary prerequisite for any control, eradication, or regulatory program. Evaluation surveys measure the results of control actions.

The cooperative economic insect survey program, a Federal-State undertaking to determine and report the abundance of economic insects, was organized on its present basis in 1951. Success of the program depends upon the full cooperation of all State agricultural agencies, including State extension services, agricultural experiment stations, agricultural college faculties, and plant and animal regulatory agencies. Commercial organizations and many allied agricultural workers also assist. In 43 States, full or part-time survey entomologists are cooperatively financed with USDA funds; in the remaining States, entomologists provide information on a voluntary basis. All information is made available to cooperating agencies at the State level before it is released nationally.

A Standing Committee on Insect Detection, Evaluation, and Prediction of the Entomological Society of America supplies important advisory guidance.

Briefly, these programs: (1) Provide a nationwide organization to help assure prompt detection of newly introduced pests; (2) help growers protect their crops from pest attack by supplying current information on insect activity and abundance; and (3) provide a basis for Federal-State quarantine, control, and eradication activities.

Since 1959, PPQ has cooperated with State regulatory and other agencies in an accelerated insect detection program within the nation's borders by utilizing the framework of the existing survey organization. The general public is encouraged to participate in this program.

Special detection surveys are conducted such as the light trapping program carried on around international ports of entry. Two hundred and eighty-three blacklight traps are operated at 168 locations considered key points for foreign insect pest introductions. These are supplemented by a diverse assortment of fruit fly, khapra beetle, gypsy moth, and Japanese beetle traps of a more specific capability. Forty insect and disease identifiers, trained in depth in the recognition of significant foreign pests, are available at the ports to identify trapped specimens. As an aid to the detection program, a series of articles on insects not known to occur in the United States are published at intervals in the "Cooperative Economic Insect Report."

The Department of Defense cooperates by providing personnel to service and submit weekly collections for identification from traps in operation on military bases. The detection work is supported by training workshops which are conducted periodically throughout the country.

The weekly "Cooperative Economic Insect Report" is the approved publication for distributing the information on a nationwide basis. Included in the report are distribution maps, crop loss figures resulting from insect damage, and other technical data relating to insect pests. Our annual "List of Intercepted Plant Pests" is in its 59th year. This publication lists foreign pests (including their hosts and origins) that were intercepted in the process

of entering the United States from abroad through various avenues of entry. Although we list only the number of lots intercepted, the number of live plant pests involved exceeds several millions annually.

Statutory authorities for the protection of plants and plant products

One of the principal reasons for the spread of plant pests and diseases with plants, plant products, and other materials shipped throughout the world is inadequate control of such pests in the country of origin. Regulations cannot prevent, though they may hinder or delay, the spread of pests to new territories. Adequate control of pests in countries of origin is the best safeguard against their spread to other countries, including the United States. Although this principle is widely accepted, the practical application is very slow. In the meantime, we must continue to depend on laws and regulations to protect against outside pests and to control pests within our borders.

The existence and responsibilities of PPQ are provided for by congressional acts and by delegations made by the Secretary of Agriculture. The acts provide the Secretary of Agriculture with authority to: (1) Establish restrictive and prohibitory quarantines and regulations against imports likely to be the means of introducing plant pests not known to be present or widely distributed in the United States; (2) establish quarantines and regulations to carry out cooperative Federal-State-Mexican suppression, control, or eradication measures against designated plant pests which become established in the United States or Mexico, and (3) provide export certification of domestic plants and plant products when requested by interested shippers and parties.

The acts, and regulations based on them, provide the foundation for a flexible but effective program for protecting the country against foreign plant pests. Under the acts, the USDA has broad authority to take appropriate measures against threatening pests and to promulgate or modify existing regulations whenever necessary.

THE FEDERAL ACTS

I. The Plant Quarantine Act (August 20, 1912, 37 Stat. 315; 7 U.S.C. 151-167).

The powers of restriction on imports granted under this act are broad, and it would seem to be clear that Congress intended to give the Secretary authority to restrict and control the entry of plants and plant products to the extent necessary to prevent the entry of plant pests. Sections 1 through 7 are the basis for the quarantines established on foreign plants and plant products.

Eighty-five quarantines have been promulgated under the act in the 60 years of its existence. Thirty of these have related to imports of plants and plant products from foreign countries, 45 to interstate movement, and 10 to movement of host material between the U.S. mainland and its offshore States and territories. Currently, there are 11 domestic quarantines, 14 foreign quarantines, and 7 territorial quarantines.

The act has been amended five times since it was enacted in 1912. The fifth and last amendment to the Plant Quarantine Act was made May 1, 1928, (45 Stat. 468). This amendment granted authority to stop--and without warrant--to inspect, search, and examine persons, vehicles, receptacles, boats, ships, or vessels, and to seize and destroy or otherwise dispose of plants and plant products or other articles found to be moving or to have moved in interstate commerce or to have been brought into the United States in violation of the act of 1912, or of any quarantine order thereunder.

In 1929, a proposed amendment to the act would have deprived the Secretary of authority to forbid the importation of nursery stock, fruits, vegetables, and other plant products unless such items were infected or infested with foreign plant pests or unless the Secretary had good reason to believe such pests were present. Since inspection alone cannot determine the presence of such pests, the Department strongly opposed the bill. On September 18, 1929, after an extended Senate discussion, the bill was dropped by common consent. There has been no serious challenge to the act since that date.

Recommendations

1. Amend the act to provide for civil penalties so appropriate and immediate action could be taken against violations of the act or any regulations under the act at ports of entry and, in certain cases, violations of domestic quarantines.

2. If civil penalties are not acceptable, amend the act to increase criminal penalty provision from \$500 to \$1,000.

3. Delete requirement regarding specific carrier notification. The Federal Register notice procedure was established as a notification tool.

4. Delete reference to wearing of a suitable badge for identification by authorized employees, and substitute wording to the effect that employee be furnished with suitable identification and/or badge.

5. For long-range planning, consider combining into one act the Federal Plant Pest Act, Plant Quarantine Act, and Organic Act.

II. Federal Plant Pest Act (May 23, 1957, 71 Stat. 31; 7 U.S.C. 150aa-150jj).

One of the purposes of the enactment of this act was to provide the USDA authority to regulate the movement of plant pests into or through the United States. A definition for plant pests was included in the act and expanded to cover diseases, mollusks, viruses, and nematodes, as well as insects.

Authorization was given the inspector to take emergency action to seize, treat, or destroy articles or products with respect to plant pests new to or not known to be widely prevalent in the United States. It provided that the least drastic actions be taken to prevent spread of plant pests--destruction, exportation, or return to point of origin. Provision was also made for the

payment of compensation to the owner for losses due to disposal of products, articles, means of conveyance, or pests. The act provided for such payment only if the owner established in court that the disposal was unauthorized by this act or the Plant Quarantine Act.

This act also authorized inspection without a warrant of persons and means of conveyance moving interstate on probable cause of threat of spread of a plant pest. The act also included provisions for entry of premises with a warrant to make any inspections and seizures necessary under the act. Violation of regulations is covered by this act, as well as violation of the act itself, and a penalty is authorized for violation of the regulations, as well as violation of the act.

Approval of the Federal Plant Pest Act in 1957 also repealed the Insect Pest Act of 1905 and the Mollusk Act of 1951. The new act supplemented and strengthened USDA activities conducted under the Plant Quarantine Act of 1912.

Recommendations

1. Increase penalty provision from \$500 to \$1,000 for violation of the act or any regulation promulgated under the act.
2. Establish regulations under new Subpart 7 CFR 330.500 covering foreign arriving carriers to provide for: (a) Notification of carrier arrival; (b) cargo and crew manifests; (c) USDA clearance of conveyances, products, and persons; and (d) redefinition of garbage. This is in progress.
3. Establish regulations under new Subpart 7 CFR 330.600 to provide increased control over avenues of entry of quarantine-significant wood-boring insects. This is in progress.
4. For long-range planning, consider combining into one act the Plant Quarantine Act, the Organic Act, and the Federal Plant Pest Act.

III. Organic Act of September 21, 1944 (58 Stat. 735; 7 U.S.C. 147a).

The original Organic Act of 1944 was enacted to give the Secretary of Agriculture authority to cooperate with farmers' associations and individuals, as well as States or political subdivisions thereof, and Mexico, in operations to control or eradicate Japanese beetle, sweetpotato weevil, Mexican fruit fly, citrus canker, gypsy moth, browntail moth, Dutch elm disease, phony peach and peach mosaic, cereal rust, corn borer, pink bollworm, and thurberia weevil.

In addition, the act gave the Secretary authority to inspect and certify domestic plants and plant products as meeting foreign sanitary requirements. This latter authority had previously been granted annually by successive appropriation acts. The act was amended in 1949 to include citrus blackfly, whitefringed beetle, and Hall scale. In 1957, it was further amended by including imported fire ant, soybean cyst nematode, and witchweed.

An important part of the 1957 amendment adds to the existing law the words "insect pests, plant diseases, and nematodes, such as" This language, according to legislative history, was intended to have the effect of permitting the Department to undertake eradication or control campaigns against insect pests coming within the same description of those listed within the section without in each case an amendment of the act to so provide. The act, when promulgated in 1944, gave the Secretary the authority to certify plants and plant products for export certification. Prior to the act, there had been a charge by the Department for such certification. This was required by each appropriation authority.

Since there were no requirements for collection of fees in the 1944 act, the collection of such fees was suspended beginning July 1, 1945.

Recommendations

1. Amend the Organic Act to use the same definition of a plant pest as is used in the Federal Plant Pest Act. This would provide authority to carry out control or eradication programs on such pests as the giant African snail.

2. Amend the act to provide authority for cooperative survey and control of pests in Canada and the countries in Central America. There is need to cooperate with these countries in the control or suppression or eradication of such pests as the Mediterranean fruit fly.

3. For long-range planning, consider combining into one act the Plant Quarantine Act, the Federal Plant Pest Act, and the Organic Act.

IV. Mexican Border Act (January 31, 1942, 56 Stat. 40; 7 U.S.C. 149).

The Mexican Border Act was enacted to provide authority to regulate, inspect, and, when necessary, disinfect vehicles, freight, express, baggage, or other materials from Mexico to prevent the entry and establishment of the pink bollworm throughout the main cotton-producing sections of the United States, as well as protecting against entry of certain other pests important to U.S. agriculture which occurred in Mexico. The Plant Quarantine Act does not provide authority to regulate entry of vehicles or authority to disinfect vehicles or articles even though they may be contaminated with plant pests. Although the Federal Plant Pest Act which was enacted in 1957 appears to provide authority to regulate vehicles, pests, and other articles now handled under the Mexican Border Act, there are some areas of indecision in reference to certain authorities under the Federal Plant Pest Act which make it desirable to retain the Mexican Border Act until decisive opinions are made on all questionable points.

One such point is cited. The Mexican Border Act provides authority to regulate the entry, inspection, and disinfection of all railway cars as a routine procedure necessary to prevent the introduction of insect pests and plant diseases from Mexico. Fees are collected to cover any cleaning or disinfection required. The Federal Plant Pest Act appears to provide such authority only as an emergency measure and would not provide the authority for the routine

cleaning, and disinfection of all vehicles including railway cars which in past years was believed to be an essential quarantine procedure at Mexican border entry ports. The fee collection procedure also appears not to be included in the Federal Plant Pest Act.

Recommendation

Make no changes nor consider repeal until certain legal questions clear up through discussions with the Office of the General Counsel, USDA.

V. Terminal Inspection Act (March 4, 1915, as amended, 38 Stat. 1113; 7 U.S.C. 166).

An agricultural appropriation act of March 4, 1915, made provision, under certain conditions, for terminal inspection by State authorities of plants and plant products transmitted interstate through the mails. Before this enactment, a State could protect itself, as now, by quarantining against plants and plant products of other States so far as shipments by freight or express were concerned, but it had no authority to interfere with shipments sent through the mails. This act grants such authority to States desiring it, provided they establish and maintain a terminal inspection service at one or more places in the State. The Federal Government pays none of the expense arising under this act, and activities in the terminal States in connection with its enforcement are carried on by the U.S. Postal Service and State authorities. The activities of PPQ are those incidental to the submission to and approval by the Secretary of Agriculture of the lists of plants and plant products that the States desire to be subject to terminal inspection and the transmission of these lists and inspection points to the postmaster. PPQ keeps a record of such approved lists and inspection points and also of the States availing themselves of the benefits of this act.

Recommendation

Recommend retention. This act grants authority to States desiring it to request the U.S. Postal Service to hold for State inspection mail containing plant material enroute to destinations within the State concerned. A recent review by all States indicated that 12 States, the District of Columbia, Puerto Rico, and the Trust Territories of the Pacific desired continued use of the act within their jurisdictions.

VI. Mexican Pink Bollworm Act (October 6, 1917, 40 Stat. 374; 7 U.S.C. 145).

This legislation was enacted because of the threat of spread of the pink bollworm into the United States from infestations found in Mexico. It gave authority to conduct surveys in Mexico, to establish cotton-free zones cooperatively with States adjoining Mexico, and to cooperate with Mexico to eradicate infestations in that country near the United States border.

The act is not used and is no longer needed since the Organic Act of the Department of Agriculture of 1944 (7 U.S.C. 147a) provides similar authority pertaining to Mexico.

Recommendations

Repeal this act because it duplicates the authority also provided by the Organic Act of the Department of Agriculture of 1944 (7 U.S.C. 147a).

VII. Incipient or Emergency Control of Pests (April 6, 1937, as amended, 50 Stat. 57; 7 U.S.C. 148-148e).

The original Incipient or Emergency Control of Pests was passed as the Joint Resolution of April 6, 1937. It was revised May 9, 1938, and an amendment was made August 13, 1954. The act authorizes the Secretary of Agriculture to spend contingency funds for the control of incipient or emergency outbreaks of insects and plant diseases. The initial legislation did not include Mexico but did include Canada. The reference to Canada was primarily for the cooperation with Canadian officials for the cooperative control of pear psylla.

The revision of 1954 included reference to Mexico to allow a joint Mexican-United States program to combat the Mexican fruit fly. As early as 1917 (40 Stat. 374), the Secretary was authorized to cooperate with Mexico on the pink bollworm program.

Recommendations

1. Amend to redefine "plant pest" to use the same definition as the Federal Plant Pest Act. This is very important since the authority to conduct control operations for pests, such as giant African snail, is not now included in the current act.

2. Amend to include authority to cooperate with Central American countries in reference to pest survey and control activities.

VIII. The Golden Nematode Act (June 15, 1948, 62 Stat. 442; 7 U.S.C. 150-150g).

The Golden Nematode Act was enacted by Congress on June 15, 1948. The purpose of the act was to establish the policy that the Federal Government carry out operations to eradicate, suppress, control, and prevent the spread of the golden nematode. It also gave the U.S. Department of Agriculture the authority to cooperate with State or other agencies in compensating growers in areas infested or exposed to infestation for losses resulting when they refrained from planting potatoes or tomatoes, or when they destroyed potatoes or tomatoes for the purpose of combating the golden nematode.

On March 23, 1948, Secretary of Agriculture Clinton P. Anderson, in a letter to Mr. Arthur Capper, Chairman, Committee on Agriculture and Forestry, United States Senate, emphasized the point that the bill would allow the Department to compensate growers and cooperators with the program. He also pointed out that there was authority for combating insect pests and diseases. He then emphasized that there was no legislation referring directly to the golden nematode.

The report on the House of Representatives dated June 3, 1948, says, in part, "The program for the control of the pest contemplated by the bill included among other things the enforcement of quarantines" It would appear that in 1948, when the Department recommended the passage of the Golden Nematode Act, the Office of the General Counsel had not made the determination that nematodes caused a disease of the host plant. In both the soybean cyst nematode quarantine and the golden nematode quarantine, we refer to the nematode as causing a "dangerous disease" of the host plant and, under the authority of the Plant Quarantine Act, we promulgated Federal quarantines for both those plant pests. It apparently was thought in 1948 that it was necessary to have a specific bill for a nematode pest rather than rely on the authority of the Plant Quarantine Act.

The provisions for compensation to the grower have not been used by the Federal Government for some years. The compensation aspects for the program are handled by the State of New York. It is unlikely that the Federal Government will undertake to pay compensation to the growers in the foreseeable future.

Recommendation

Recommend that the Office of the General Counsel (OGC) be contacted, and, if they agree that the authority to promulgate quarantines for nematodes as plant pests exists under the Plant Quarantine Act, to prepare a written opinion confirming the decision. The Golden Nematode Act could then be repealed. If a favorable opinion is not given by OGC, the act should be retained.

IX. Cooperation with States Act (September 28, 1962, 76 Stat. 663; 7 U.S.C. 450).

This act provides for the Secretary of Agriculture to cooperate with State agencies in the administration and enforcement of Federal laws and regulations relating to marketing of agricultural products and to the control or eradication of plant and animal diseases and pests. Though many other present statutes authorize cooperation with States, there are some which impose restrictions on those cooperative activities. Under this act, the Secretary may enter into cooperative arrangements with State agencies in the administration and enforcement of Federal laws and regulations to the extent he deems appropriate in the public interest.

Although it does not appear that any of the various cooperative Federal-State programs now in effect under Veterinary Services (VS) or PPQ agreements use this act as their authoritative basis, Meat and Poultry Inspection (MPI) currently uses the authority in designated cooperative Federal-State programs.

Recommendation

Retention of the act as now written.

X. Halogeton Glomeratus Control Act (July 14, 1952, 66 Stat. 597; 7 U.S.C. 1651-1656).

The Halogeton Glomeratus Control Act was recommended by the Department of Agriculture and the Department of the Interior. It established a general Federal policy and general authorization for eradication and control of poisonous weeds, especially Halogeton glomeratus, on lands in the United States which would materially aid in protecting the livestock industry from losses by such weeds. It proposed survey, research, and action programs as integral and essential parts for successfully attacking the poison plant program. When the act was passed in 1952, infestations covered seven States comprising 1,808,605 acres. A limited program of reseeding depleted and infested rangeland was begun but was ineffective, and little or no control efforts have been expanded in recent years.

Recommendation

Recommend termination of this act. The proposed Federal Noxious Weed Act would repeal the act and provide authority for carrying out controls should future action be deemed necessary.

List of plant quarantines

Quar. No.	Name of Quarantine	Effective	Revoked or Superseded by Quar.	
1 F	White Pine Blister Rust	9-16-12	5-21-13	7 *
2 D	Mediterranean Fruit Fly	9-18-12	5-1-14	13 *
3 F	Potato Wart	9-20-12	3-1-22	**
4 D	Gypsy Moth & Browntail Moth	11-25-12	8-1-13	10 *
5 F	Mexican Fruit Fly	1-22-13	12-1-36	
6 D	Date Palm Scale Insects	3-24-13	7-1-36	
7 F	White Pine Blister Rust	5-21-13	9-1-36	***
8 F	Pink Bollworm of Cotton	7-1-13		
9 T	Pink Bollworm of Cotton (Domestic--Hawaii)	6-24-13	8-15-20	23 *
10 D	Gypsy Moth & Browntail Moth	8-1-13	8-1-14	17 *
11 F	Powdery Scab of Potato	12-24-13	1-1-16	
12 F	Avocado Seed	2-27-14		
13 T	Mediterranean Fruit Fly and Melonfly (from Hawaii) Fruits & Vegetables	5-1-14 6-24-48	(changed to Hawaiian)	
14 D	Powdery Scab of Potato	8-1-14	9-1-15	
15 F	Sugarcane	6-6-14		
16 T	Sugarcane	6-6-14		
17 D	Gypsy Moth & Browntail Moth	8-1-14	7-1-15	22 *
18 D	Powdery Scab of Potato	11-16-14	9-1-15	
19 F	Citrus Nursery Stock	1-1-15		
20 F	European Pines (Pine Shoot Moth)	7-1-15	9-1-36	***
21 F	Diseases of Indian Corn	3-8-15	7-1-16	24 *
22 D	Gypsy Moth & Browntail Moth	7-1-15	7-1-16	25 *
23 T	Hawaii & Puerto Rican Cotton	7-1-15	8-15-20	47 *
24 F	Corn Diseases	7-1-16		
25 D	Gypsy Moth & Browntail Moth	7-1-16	7-1-17	27 *
26 D	White Pine Blister Rust	6-1-17	3-15-22	54 *
27 D	Gypsy Moth & Browntail Moth	7-1-17	7-1-18	33 *
28 F	Citrus Fruits	8-1-17		
29 F	Sweetpotato & Yam	1-1-18	2-9-73 (12-20-58 title changed to sweetpotatoes)	
30 T	Sweetpotato & Yam (Hawaii)	1-1-18	(10-10-34 title changed to sweetpotatoes)	
31 F	Banana Plants	4-1-18	5-2-51	
32 T	Banana Plants (Hawaii)	4-1-18	5-2-51	
33 D	Gypsy Moth & Browntail Moth	7-1-18	7-1-20	45 *
34 F	Bamboo	10-1-18		
35 D	Japanese Beetle	6-1-19	4-1-20	40 *

NOTE: See footnotes at end of list.

<u>Quar. No.</u>	<u>Name of Quarantine</u>	<u>Effective</u>	<u>Revoked or Superseded by Quar.</u>	
36 D	European Corn Borer	10-1-18	3-29-20	43 *
37 F	Nursery Stock, Plants, and Seeds	6-1-19		
38 D	Black Stem Rust	5-1-19		
39 F	Flag Smut & Take-all Diseases	8-15-19	2-1-26	59 *
40 D	Japanese Beetle	4-1-20	10-1-20	48
41 F	European Corn Borer and other Dangerous Insects and Plant Diseases	2-21-20		
42 F	Indian Corn or Maize from Mexico (Q. 42 revoked, and regulations combined with Q. 41, effective 3-1-27)	2-21-20	3-1-27	
43 D	European Corn Borer	3-29-20	7-15-32	
44 F	Stocks, Cuttings, Scions, and Buds of Fruits	6-1-20	7-1-32 (brought in under Q. 37)	
45 D	Gypsy Moth & Browntail Moth	7-1-20		
46 D	Pink Bollworm	8-1-20	9-10-21	52 *
47 T	Hawaii & Puerto Rican Cotton, Cottonseed, and Cottonseed Products	8-15-20		
48 D	Japanese Beetle	10-1-20		
49 F	Citrus Blackfly	4-1-21	11-1-23	56 *
50 D	Mexican Bean Beetle	5-1-21	7-23-21	
51 D	Movement of Sugarcane, Corn, Cotton, Alfalfa, & Fruits of Avocado & Papaya from the United States to Hawaii Restricted	10-1-21	3-1-48	
52 D	Pink Bollworm	9-10-21		
53 D	Satin Moth	1-1-22	11-2-36	
54 D	White Pine Blister Rust	3-15-22	10-1-26	63 *
55 F	(Seed or Paddy) Rice	9-1-23		
56 F	Fruits and Vegetables	11-1-23		
57 F	Canadian Christmas Trees and Greens	7-1-24	7-1-28	
58 T	Fruits and Vegetables of Puerto Rico	7-1-25		
59 F	Flag Smut Disease	2-1-26		
60 T	Sand, Soil, or Earth from Hawaii & Puerto Rico	3-1-26		
61 D	Thurberia Weevil	7-15-26	4-18-52	
62 D	Narcissus Bulbs	7-15-26	4-1-35	
63 D	White Pine Blister Rust	10-1-26		

NOTE: See footnotes at end of list.

<u>Quar. No.</u>	<u>Name of Quarantine</u>	<u>Effective</u>	<u>Revoked or Superseded by Quar.</u>
64 D	Mexican Fruit (Worm) Fly	8-15-27	
65 D	Woodgate Rust	11-1-28	7-31-39
66 D	Asiatic Beetle & Asiatic Garden Beetle	3-15-29	3-1-30
67 D	Phony Peach Disease	6-1-29	3-1-33
68 D	Mediterranean Fruit Fly	5-1-29	11-15-30
69 F	Packing Materials	7-1-33	
70 F	Dutch Elm Disease	10-21-33	5-15-66
71 D	Dutch Elm Disease	2-25-35	5-1-47
72 D	Whitefringed Beetle	1-15-39	
73 F	Coffee	4-1-40	
74 F	Cut Flowers	8-1-47	
75 D	Hawaiian Citrus Nursery Stock	9-15-47	changed to
	Citrus Canker Disease from Hawaii Q. 75	2-12-54	6-21-57
76 D	Khapra Beetle	2-21-55	9-2-72
77 D	European Chafer	9-1-55	9-30-72
78 D	Mediterranean Fruit Fly	5-16-56	11-25-66
79 D	Soybean Cyst Nematode	7-26-57	9-30-72
80 D	Witchweed	9-6-57	
81 D	Imported Fire Ant	5-6-58	
82 T	Guam	8-21-59	
83 D	Unshu Oranges	7-3-67	
84 D	Cereal Leaf Beetle	4-1-69	10-1-73
85 D	Golden Nematode	7-31-69	

* Amended and superseded by.

** Superseded by Potato Regs.

*** Now under Quarantine No. 17.

Certificates and permits

CERTIFICATES

Quarantine regulations authorize an inspector to issue certificates when: (1) In his judgment the articles have not been exposed to infestation; (2) he has examined the articles and found them free of infestation; (3) he has supervised approved treatment of the articles to destroy infestations; or (4) the articles were grown, produced, manufactured, stored, or handled in such a way that in his judgment no infestations would be transmitted by them. Inspectors may withdraw or cancel certificates and may refuse to issue further certificates whenever it is determined their continued use might allow a pest to be spread.

No overall policy change is recommended in the issuance of certificates. However, some modification in individual cases may be made in the review of the individual quarantines.

PERMITS

Quarantines provide that under certain conditions an inspector may allow regulated articles that have not been certified to be moved under permit to specified destinations for limited handling, utilization, processing, or treatment.

Permits may be issued to allow the movement of living pests for scientific study if adequate safeguards are taken to prevent its dissemination.

The permit system (Limited Permit, PPC 5-3, Limited Permit [Sticky-Back], PPC 5-37, Scientific Permit, PPC 5-35, and Permit Used in Transit Inspections, PPC 5-46) was found to be working satisfactorily, and no policy change is recommended.

A review of the PPC 5-50 indicated that the use of this form is restricted to limited use in the New England States. The use pattern does not appear to justify continuation of PPC 5-50. It is recommended that the Chief Staff Officer, Regulatory Services, PPQ, APHIS, USDA, make a determination as to whether this limited use justifies continuation of this permit or whether alternate arrangements can be made.

HOLD ORDER

An authenticated order or notice is issued to the owner or person in charge or possession of a premise, plant, conveyance, or article infested or exposed to infestation, making it unlawful to move the specific article(s) set forth in the order or notice unless treated in accordance with prescribed procedures.

No change is recommended.

Compliance agreements

Compliance agreements are written agreements between PPQ and a person engaged in growing, dealing in, or moving regulated articles whereby the person agrees to comply with quarantine requirements as specified in the agreement.

In my review of the use of compliance agreements, I found no disagreement with the basic policy established. In accordance with Regulatory Guidelines, inspectors should review compliance agreements at least annually and, if needed, semiannually. Some spot checks during the year to determine compliance with stipulations may be needed. However, there are some instances when inspectors make spot checks too frequently. If frequent checks (more than once each quarter) seem to be indicated, then a review should be made to determine whether the person should, in fact, be issued a compliance agreement.

Regulated articles

Regulated articles are listed and described in the quarantine. They include commodities, equipment, and transportation facilities known to be pest carriers, or other items that might spread a pest. For example, they may include plants on which an adult insect feeds or soil that the insect may inhabit. Also included are objects or articles upon which an insect may lay its eggs, conveyances that might harbor the pest, alternate hosts for plant diseases, and susceptible plants themselves.

Articles listed in the quarantine regulations cannot be moved lawfully from regulated areas into or through other specified areas except in the manner and method described in the regulations. Certificates or permits are used to indicate that the regulated articles are eligible for interstate movement.

In the chapter "Relationship Between Introduction and Establishment of Plant Pests," we discussed the difference between "introduction" of a pest and "establishment" and the need to categorize regulated articles on the basis of pest risk. In the future, when domestic plant quarantines are established and regulated articles are listed, it is recommended that research and methods development personnel identify, evaluate, and rank principal pathways of spread of the pest. The articles to be regulated would be ranked according to their pest risk. Therefore, the rational thing to do is concentrate on those commodities and conveyances that fall within the high hazard area. Under such systems, only "high" risk items would be regulated. "Low" risk items would be placed in a separate category or exempted altogether. Under our present system, "low" and "high" risk items are all treated alike. The inspectors at the local level are placing as much energy on regulated "low" risk commodities as they are on "high" risk commodities.

In the study group's review of the domestic plant quarantines, careful attention was given to the list of regulated items. Based on the committee's

own field experience and conversations with colleagues, recommendations are made for removal of a number of items from the regulated list of the various domestic plant quarantines.

The transit inspection system

Transit inspection was begun in 1920 to assist in the enforcement of the White Pine Blister Rust Quarantine. Arrangements were made at that time to place inspectors at strategic Midwest traffic centers and transfer points so that freight, express, and parcel post shipments could be checked on their way to the West. This type of inspection was found so effective that the service was set up as a specific project in the Bureau of Entomology and Plant Quarantine on July 1, 1930, and expanded to provide the same type of assistance in enforcement of other Federal domestic quarantines and to furnish reports to State inspection officials of shipments observed to be moving in these channels in apparent violation of State plant quarantines or nursery inspection requirements. Assistance was also given to the Foreign Plant Quarantine Service by calling attention to foreign shipments of plants and plant products found to be moving in violation of foreign plant quarantine regulations.

By 1950, transit inspection was operating at 16 major freight, express, and parcel post distribution and rail transfer centers. It kept under scrutiny traffic movements in all directions, which aided the enforcement of Federal domestic plant quarantines.

In 1953, the U.S. Department of Agriculture was reorganized. The regulatory and research work of the Bureau of Entomology and Plant Quarantine was divided into divisions. Domestic plant quarantine work was assigned to the Plant Pest Control Division, and foreign plant quarantine work was assigned to the Plant Quarantine Division. The responsibility for transit inspection work was also given to the Plant Quarantine Division. Most of the transit work from the time it began in 1930 through the end of World War II had been centered primarily in cities with large rail and post office terminals. Following World War II, rail and express traffic decreased as airfreight and truck traffic increased. Therefore, the need for placing emphasis on transit inspection at major rail terminals and post offices decreased. Today, transit inspection is carried out at post offices in only five cities.

In 1966, a review of the transit operations was made in an effort to determine how the objectives of plant protection programs could best be met. It was determined that interstate truck traffic had become the single most important means of moving commodities in this country, particularly truck traffic that carried regulated articles. Approximately 18 million truck carriers were in operation in this country. It was obvious, therefore, that trucks were potentially the most hazardous carriers of quarantine articles. In order to best control this potential hazard, it was decided to transfer the transit operations for domestic plant quarantines from the Plant Quarantine Division to the Plant Pest Control Division. A plan was developed to place eight transit inspectors around the periphery of the regulated areas in the United States. These inspectors were to be headquartered at cities which

were focal points for truck transportation. Because of budgetary and personnel ceiling restrictions, it was only possible to place two of these stations into operation. The two men placed in these positions not only carried out transit operations but spent a considerable part of their time training plant protection inspectors how to carry out transit inspections for domestic plant quarantines. They also contacted State regulatory, highway, and police officials to gain cooperation in transit activities.

The concept of transit inspection work is not adequately defined in any specific guidelines. Currently, opinions defining transit inspection range from "it is purely a method to enforce the quarantine" to "it is purely an educational tool which aids in obtaining quarantine compliance." Transit inspection does indeed touch upon both extremes, but it also covers much space between these conflicting views. Transit inspection is also a tool by which we can evaluate the effectiveness of our regulatory actions.

Transit activity is emphasized in certain States and deemphasized in others. The reason why this is done is based on unrelated factors such as availability of personnel, funds, etc. It does not relate well geographically to the proximity of quarantines, knowledge of the movement of regulated articles, or other concrete factors. The vast majority of violations discovered are termed technical in nature, i.e., the articles are certifiable but for one reason or other, no accompanying certificates were intercepted. Currently, at the field level, all violations discovered must be treated by the same standards. This results in handling many reports and investigating violations which have little or no effect in reducing or eliminating real hazards (see discussion and recommendations under the chapter on Violations).

Nearly all field and cooperating personnel agree that transit inspection cannot achieve 100 percent interception of articles in violation of quarantines. Agriculture quarantine regulations are only one of many laws, rules, and regulations that commercial carriers are obliged to comply with, and they naturally will adhere only to those rules that could cause the greatest trouble for them if broken. This attitude by carriers encourages their personnel to also neglect compliance with rules. If carriers and their personnel are not continually reminded of the regulations through informational channels and by a certain amount of transit inspection, they may completely ignore them. The cooperation by carriers in transit inspection has been good.

Recommendations

1. The concept of transit inspection be defined in specific and clear terms in 805 guideline memoranda and letters to State and Territory Agricultural Regulatory Officials.

2. A nationwide sampling plan for continuing transit inspection should be developed. This would include:

- a. Determining movement pattern of each regulated article under quarantine.

b. Determining when, during the year, the greatest movement of regulated articles occurs and comparing this to the life cycle of the pest under quarantine.

c. Determining what portion of the total amount of each regulated article is moved by which carrier type, i.e., truck, air, etc.

d. Determining if distribution centers exist for certain regulated articles and the relative location of these centers.

3. With this and other input data it should be possible to develop a statistically sound plan to sample and inspect the various carriers so that the results can indicate the relative effective degrees of our regulatory actions. This plan should be based on a desirable number of inspections of each type, i.e., terminal, road checks, etc., distributed in time over the year and geographically over the nation. If such a plan is developed, it should be adhered to at the field level and in all areas with an assigned minimum number of inspections to be made for each State. This plan does not call for any additional personnel. Transit inspections would be made by inspectors in each State as an assigned additional duty to their normal operations. If a strategically designed transit inspection program can be designed, the implementing of the program should become the responsibility of the Regional Directors and State Supervisors.

4. The two positions for transit inspection coordinators currently assigned to the program should be abolished after the biometrically designed inspection system becomes operational.

5. A transit inspection coordinator position should be established on the staff of Regulatory Services of PPQ to handle administrative details connected with the nationwide transit inspection program. Under this plan, both domestic and port program personnel would become involved in transit activities as workloads permit from their major assigned duties.

6. An improved information program to the general public and regulated industries should be implemented.

7. Personnel of the Port Operations (agricultural quarantine inspection) program, now a part of Plant Protection and Quarantine Programs, participate in the transit inspection system to a limited degree. Such activity is carried out principally in post offices and rail terminals. Approximately 1,900 man-hours are involved in agricultural quarantine inspections at five ports. The few violations found consist mainly of missing inspection labels on tags. It is recommended that Port Operations' routine participation in transit inspection as now handled be discontinued. If it is decided to continue a transit inspection program in PPQ under a reorganized plan, Port Operations may be able to assist in the new plan.

Quarantine violations

Procedures for reporting and investigating domestic quarantine violations are contained in PPC Division Memorandum No. 805.4 dated May 12, 1967. This memorandum outlines the responsibility and procedures for reporting and investigating apparent violations of Federal domestic plant quarantines.

Violations should be fully reported, investigated, and disposed of promptly. Violations which may require action on the part of the Office of the General Counsel also need prompt action to facilitate the successful conclusion of any legal action necessary. Prompt action regarding the regulated article held in violation sometimes may be necessary.

The form PPC 5-8 is used for reporting Federal domestic quarantine violations.

The nature of the violation will determine the extent to which investigation is necessary. If there is no obvious intent to violate the quarantine regulations, only limited followup action should be necessary. For example, if Mrs. Jones moves a noncertified house plant out of the regulated area in ignorance of a plant quarantine, no formal action should be taken in reporting such action as a violation. In such cases, the individual should be made aware of quarantine regulations to prevent future violations. The disposal of such violations should be handled at the local level.

In the case of flagrant quarantine violators, i.e., those that knowingly and willingly violate the law, they should be the subject of a complete investigation for possible criminal prosecution. In the case of all violations, sound discretionary judgment should be exercised at the local level in deciding which cases should be developed for possible criminal action.

In my view, the inspector, District Supervisor, or State Supervisor--those having responsibility for enforcing quarantines at the local level--are the ones best suited to judge who has willfully violated the quarantine. They are no different, in my opinion, from the policeman on the beat or in a squad car, who must judge whether or not to issue a traffic violation. According to an informal opinion by the Office of the General Counsel, it is the responsibility of legal counsel to screen violations to determine if a case should be prosecuted. However, because of the large number of violation forms submitted annually, the inability of the Office of General Counsel to review all of them, and the limited risk factor involved in most of the violations, a decision of whether or not to recommend prosecution is, in fact, being made at the local and Hyattsville, Maryland, level. It is my recommendation that if pest risk can be taken care of on the spot by the inspector, a quarantine violation form need not be written. If the inspector, however, determines the quarantine violation merits recommendation for prosecution, then a violation form should be forwarded stating such a recommendation.

In a review of quarantine violations submitted over a period of the past 3 years, statistical information indicates that about 1,000 violations are reported annually. Of the 1,000 reported, less than 10 go to the Justice Department with recommendation for prosecution.

Emergency regulations

Section 106 of the Federal Plant Pest Act, (7 U.S.C. 150ee), authorizes the Secretary to promulgate emergency regulations requiring inspection of products and articles of any character whatsoever and means of conveyance, specified in the regulations, as a condition of their movement into or through the United States, or interstate, and imposing other conditions upon such movement, as he deems necessary to prevent the dissemination into the United States, or interstate, of plant pests, in any situation in which such regulations are not authorized under the Plant Quarantine Act.

Section 8 of the Plant Quarantine Act, (7 U.S.C. 161), authorizes the Secretary of Agriculture to invoke quarantines; however, Section 8 requires the Secretary to hold a public hearing before promulgating his determination that it is necessary to issue a quarantine under that act.

Section 106 of the Federal Plant Pest Act gives the Secretary a legal basis for taking emergency quarantine action pending a determination to either hold a hearing under Section 8 of the Plant Quarantine Act or to declare the pest as nonhazardous. Section 106 does not state how long emergency regulations may stay in effect before the above actions should be taken. Several recent plant pest problems point up the need for a clearer understanding as to how long emergency regulations can remain in effect.

On June 11, 1970, emergency regulations under the Federal Plant Pest Act were invoked against the European crane fly. These regulations continued in effect until December 7, 1972. In December 1971, the Office of the General Counsel, in commenting on the length of time the emergency regulations had been in effect, gave an opinion that from a legal viewpoint, PPQ was on tenuous ground.

Emergency regulations for giant African snail were imposed on October 9, 1971, and continue in effect at this time. In August 1971, the Office of the General Counsel, in commenting on this situation, stated that in their view it was not the intent of the Federal Plant Pest Act for emergency regulations to apply for such an extended period of time or to apply to generations of snails that were not moved into the United States or interstate. The Office of the General Counsel stated that in their view this authority clearly applies only to plant pests that are moving or at some time have moved into the United States or interstate and would not apply in progeny of plant pests if the progeny had not been so moved. They indicated that it was their belief that a condition which extended for as long as 3 years was not an emergency within the intent of the act. On the other hand, during the drafting of the Federal Plant Pest Act in 1957, the final paragraph of proposed Section 106 (which stated that emergency regulations shall not be valid longer than 90 days after their issuance) was discarded in conference prior to introduction of the House bill. It would appear from this action that the intent was to treat each situation on its own merits but, no doubt, hold it to a reasonable period.

A similar situation exists with citrus blackfly. Emergency regulations were imposed on April 21, 1971, and, at that time, no decision had been made concerning the holding of a public hearing to determine the need for a quarantine, as provided in Section 8 of the Plant Quarantine Act. These examples demonstrate the need to have a clearly defined policy concerning the use of emergency regulations.

Quarantine regulations

Quarantine regulations have the force and effect of law. Only those restrictions or requirements needed to prevent spread of a pest are imposed. For example, although entire States may be placed under quarantine, except for proof of origin, the restrictions on commerce are limited to areas considered infested.

Official domestic quarantine regulations are issued by the U.S. Department of Agriculture until Title 7, Chapter 3, Part 301, of domestic plant quarantine notices, pursuant to Sections 8 and 9 of the Plant Quarantine Act, as amended, and Section 106 of the Plant Pest Act.

Official domestic plant quarantine notices are reviewed by the Office of the General Counsel for legal terminology and serve as a legal document in cases of violation when prosecution is sought. A number of persons have commented on the difficulties of reading and understanding domestic plant quarantine notices as presently constituted. However, it is recommended that for legal reasons, plant quarantine notices continue to be written and issued on the same basis as they are currently. Official quarantine notices should be routinely distributed only to the regional and State PPQ offices.

Upon issuance of the legal domestic plant quarantine notices, the Chief Staff Officer concerned should prepare a working domestic plant quarantine written in nonlegal language. This document would be an interpretation of instructions contained in the legal document. The working paper would contain the Federal quarantine number, name of pest, area under quarantine, commodities covered, restrictions, and other needed details. This working document would receive wide distribution to all Federal and State personnel concerned with enforcement of a domestic plant quarantine.

This recommendation has already been partly implemented by the issuance of the "quarantine maps." The proposals for simplifying interpretations of a Federal plant quarantine could be done by adding to the reverse of this map any additional pertinent information required by field personnel.

Regulated areas

Regulated areas may be entire States or parts of States. These areas comprise actual infestations and a surrounding safety border. The areas to be regulated for each pest are defined in the 803-00.9000 series of the Survey Manual. An area remains under regulation until it is determined that the pest is no

longer a menace. As necessary, regulated areas are redefined to reflect changes in the extent of infestations. Such changes are considered carefully with the States concerned before any action is taken.

There has been some comment on the manner in which regulated areas are designated. With certain exceptions, the designation of regulated areas is based on political subdivisions, such as townships or county lines. The suggestion has been made that regulated areas be based on a biological basis rather than a political one and that the designation of areas be defined on the basis of a trade area or on some ecological basis. Both points of view have some validity and, after reviewing the matter, I do not feel that we can make a recommendation either for or against political subdivisions. This seems to be a problem that is dependent upon a number of factors that must be evaluated at the time regulated areas are established.

Instructions 805.9, III, Section A of this guideline, give 17 criteria for consideration in establishing a regulated area. The basic responsibility for setting regulated area lines lies with the District Supervisor and State Supervisor. The guidelines are sufficiently broad to allow supervisors to establish regulated areas on the basis of ecological areas or political subdivisions, whichever in their judgment seems to be most appropriate.

In all cases, the supervisor, in defining regulated areas, needs to keep in mind the objective of the program. In other words, regulated areas must be correlated with program objectives. For example, eradication versus containment.

Mathematical Models

The term "mathematical model" has no universally accepted definition; however, the idea of mathematical models is almost as old as mathematics itself. The reason we hear so much about models today is that with the invention of the computer it made possible the practical use of models. The model is really any simplified representation of the real world that enables us to anticipate how things are going to react and better enables us to communicate our ideas. Mathematical models have found their most practical use in the description of physical phenomenon. Managers must be familiar with the concepts involved, including both their strengths and limitations. Although a mathematical model may sacrifice certain qualitative relationships, an accurate model can predict the quantitative effect of proposed course of action. A mathematical model is not a substitute but an added tool. Mathematical models are being used with varying degrees of sophistication by Federal, State, and local Governments.

Mathematical models have already had a small beginning in the field of biological sciences and plant pest control. The California Department of Agriculture has developed models in connection with their 1971 plant quarantine evaluation study. The National Science Foundation is providing some financing for model building in connection with the international biological year. Texas A. & M. University is constructing models in connection with the boll weevil eradication program. Thus, a handful of pioneers are recognizing models as a powerful management tool.

Let us consider the following model, proposed by staff members of the California Department of Agriculture, for estimating the amount of protection provided by a quarantine program.

Chance of establishment is:

$$P = [(V \times I \times M)_n \times D_n] [(S \times L \times R)_n \times Q_n] / B_n$$

Where:

E = Numbers of live pests entering State with

$$E = [(V \times I \times M)_n \times D_n]$$

V = Volume of infestibles - sum of (incoming shipments X number of infestible items in each shipment) for the period n.

I = Infestation factor at origin - mean % of (infestible items from each origin X number of pests per item when placed in shipment) for the period n.

M = Mortality in transit from any cause = 100% - (% mortality from regulatory actions + % mortality from other causes) during period n.

D = Deterrence factor = 100% - % of the volume of items with live pests not entering due to fear of quarantine action.

and

C = % chance that live pests entering will colonize during period n, with

$$C = [(S \times L \times R)_n \times Q_n]$$

S = Survival factor = % of E entering at adequate season and stage of pest for survival.

L = Locus of destination = % of E arriving at a destination location adequate for colonizing.

R = 100% - % reduction in pest numbers at destination from any cause other than quarantine.

Q = 100% = % reduction of live pests due to quarantine action within California.

and

B = Biotic potential for colonizing = the minimum number of pests required to colonize at destination during period n.

The effectiveness of quarantine actions would then be the part played by D, Q, and part of M in reducing the chance of establishment P. By entering the proper figure in these factors one can test the relation value of quarantine action at origin, at border stations, or at destination post offices.

In using or testing the model, shipments of similar size are grouped for the period under consideration, and the number of these becomes n for statistical purposes. Also, the percent infestation is converted to the relative expected frequency of pests in shipments of grouped sizes. Then P is computed twice--once with Q in the formula and again with Q not in the formula. The change or difference in P represents the value of the quarantine action in reducing chance of establishment of the pest.

The unit in which protection is measured is the number of pests necessary to establish a colony. For example, $P=1$ means that exactly the number of pests needed to start a colony are getting through. $P=10$ means that 10 times the number required to start a colony are getting through. $P=1/2$ means only half the number required to start a colony are getting through. What these numbers might mean in dollars to the farmers who might be affected is speculative. There does seem to be information for a quarantine program manager in these figures.

This is a conceptual model. The model maker has considered the number of factors he feels are important in describing protection. Note, also, he has provided an arbitrary definition of protection in terms of the number of pests required to start a colony. He has selected measures for the factors and placed the factors logically in a formula.

There may be other important factors. The selected factors may not be placed in the proper formula. It may not be (and probably is not) possible to obtain good estimates of the values of the factors. Despite all this, the formula provides a means for looking at the relations among the factors and protection. Before this model could reasonably be accepted as a reflection of the real world, it would have to be verified by experimental methods.

Validity of this type of model requires that each factor be independent of the others. In testing, the model independence has been found to occur when dealing with some species of insects but not with others.

The California Department of Agriculture has experimented with models in connection with pest entry prevention and in ranking pests according to their importance. The mathematical model for pest entry prevention represents a modest beginning in understanding the complex relationships between pests, their spread, and their ultimate establishment. The model represented here is only an example and does not represent a proven formula. Additional work, including some biological research, will be needed to develop a model that will adequately stimulate pest entry.

This discussion of mathematical models is included in this report because of the impact that models will have on future plant pest control decisionmakers.

The California Model for Ranking Pests

In California, the Department of Agriculture has developed a model for ranking those pests that are not established in the State. This was done as part of an assessment of California's plant quarantine program. Each pest was given a numerical score based on the following set of values:

Economic Impact (Includes damage and additional costs)

- 0--No effect (less than \$100,000)
- 1--Minor effect (\$100,000 to \$1,000,000)
- 2--Major effect (More than \$1,000,000)

Social Impact

- 0--Affects up to one million persons
- 1--Affects one million to five million persons
(25% of California's population)
- 2--Affects more than five million persons

Environmental Impact

- 0--No effect
- 1--Loss limited to damage only
- 2--Loss of one or more species

Under this scheme, the higher the numerical score, the more dangerous the pest.

Justification for State action when Federal regulatory programs are discontinued

There is considerable feeling among some State officials that guidelines need to be developed for States to follow when Federal plant quarantines are discontinued. The recent revocation of the Soybean Cyst Nematode Quarantine and the regulatory action taken on the part of some States have served to focus attention on this problem. The point is made, and perhaps justifiably so, that if the soybean cyst nematode (or any other pest under Federal quarantine) is beyond the control of the Federal Government, then how can individual State quarantines be effective?

As one State official put it, "Some State officials are acting on an emotional basis, and placing the State quarantines is not justified from a financial or biological standpoint." Most States, infested and noninfested, are not able to conduct an adequate survey program to determine spread of the pest--in the absence of Federal support.

Without adequate survey to accurately define the infested area, the States that put on exterior quarantines are only getting false security. The situation will get progressively worse as the years go on because the pest

will spread to new areas. One State official said, "If we continue to get a rash of State quarantines every time the Federal Government discontinues a program, we are creating a lot of unenforceable regulations, thus discrediting the quarantine system. We are ending up with a lot of 'paper' quarantines."

Another State official wrote me as follows: "First, when a Federal quarantine is revoked, based on the Principles of Plant Quarantine Guidelines as adopted by the National Plant Board, it is my opinion that every State should accept the decision to do away with the quarantine. Certainly the quarantine will not be revoked if there is a reasonable possibility of preventing spread to noninfested parts of the country. Secondly, when States act on their own, and enact State quarantines in an attempt to prevent a pest from entering their State because a Federal quarantine for that particular pest has been revoked, they are doing two things: (1) Kidding themselves into thinking they can prevent the pest from gaining entrance to their State, and (2) undermining the regional and national plant board concept. This, in my opinion, is the greatest problem created when a State takes unilateral action of this nature. If the situation created by revocation of Federal soybean cyst nematode and European chafer quarantines continues following revocation of every Federal quarantine, then we might as well dissolve both the Regional and National Plant Boards! Thirdly, when it is determined that a Federal quarantine, in its present form, can no longer effectively prevent spread of the pest, possibly revisions of the quarantine which would omit certain phases of the quarantine that are no longer applicable should be considered, rather than revoking the entire quarantine. For instance, under the European Chafer Quarantine and Cereal Leaf Beetle Quarantine, maybe only the most hazardous articles should be considered necessary to be regulated and all other aspects of the quarantine be dropped."

As Dr. W. R. Orton, Federal Horticultural Board, stated more than 40 years ago, "We stand in danger of subjecting ourselves to ineffective and hampering regulations without adequate gain unless the quarantine is based upon a firm scientific foundation of sound biological principles derived from properly coordinated facts relating to the nature of the pest to be dealt with."

CONCLUSIONS AND RECOMMENDATIONS

1. How hard it is or how easy it is to establish an insect pest or plant disease in a new area is a critical question that must be answered in deciding on articles to be regulated by any domestic plant quarantine. When a new quarantine is established, an indepth study should be made by the Methods Development Staff of PPQ to identify, evaluate, and rank pathways of spread. Commodities and areas to be regulated should be based on pest risk. Only those commodities that fall in the "high risk" category would be regulated. "Low risk" items would be placed in a separate category or exempted altogether.

2. One of the most important requirements in the field of regulatory operations lies in having close relationships with scientists conducting research, since practically all successful attacks on newly introduced pests represent the translation of special knowledge into field operations. Supporting research is thus essential for quarantine operations, as well as control practices. It is recommended that there be established a clear Department policy regarding the relationship between support research and plant regulatory operations. It seems appropriate, in order to insure financial research support for APHIS programs, to work out an arrangement within the Department whereby each regulatory program line item in PPQ is supported by a line item in the ARS budget. PPQ should not overlook the use of CSRS and State agencies in providing supporting research for regulatory programs.

3. Scientific and academic communities have expressed the need for closer ties with PPQ personnel working in their States and a more indepth knowledge of domestic plant quarantine programs and port operations. It is recommended that a more effective working relationship with subject matter scientists and members of the academic community be developed. This can be done by: (a) Holding an annual critique of program activities with interested personnel; (b) planning visits to key personnel; and (c) encouraging State Supervisors, Inspectors in Charge, and Regional Directors to participate in seminars and similar activities.

4. The Information Division, APHIS, and the appropriate program staff officer should prepare a "situation report" on each program. Such a report would be used to keep scientific and academic communities, industry, and an affected public better informed. The report should be revised and reissued whenever there are major revisions on program operations.

5. Federally sponsored pest control programs should be carefully monitored to determine: (a) Whether they are achieving their goals and objectives; (b) when they have met their peak effectiveness; and (c) whether the benefits derived justify the costs of continuing the programs. It is recommended that an indepth review of each PPQ program be made on a 1- to 3-year basis by a select group.

6. Statutory Authorities for the Protection of Plants and Plant Products:

A. The Plant Quarantine Act (August 20, 1912, 37 Stat. 315; 7 U.S.C. 151-167).

(1) Amend the act to provide for civil penalties so appropriate and immediate action could be taken against violations of the act or any regulations under the act at ports of entry and, in certain cases, violations of domestic quarantines.

(2) If civil penalties are not acceptable, amend the act to increase criminal penalty provision from \$500 to \$1,000.

(3) Delete requirement regarding specific carrier notification. The Federal Register notice procedure was established as a notification tool.

(4) Delete reference to wearing of a suitable badge for identification by authorized employees, and substitute wording to the effect that employee be furnished with suitable identification and/or badge.

(5) For long-range planning, consider combining into one act the Federal Plant Pest Act, Plant Quarantine Act, and Organic Act.

B. Federal Plant Pest Act (May 23, 1957, 71 Stat. 31; 7 U.S.C. 150aa-150jj).

(1) Increase penalty provision from \$500 to \$1,000 for violation of the act or any regulation promulgated under the act.

(2) Establish regulations under new Subpart 7 CFR 330.500 covering foreign arriving carriers to provide for: (a) notification of carrier arrival, (b) cargo and crew manifests, (c) agriculture clearance of conveyances, products, and persons, and (d) redefinition of garbage (in progress).

(3) Establish regulations under new Subpart 7 CFR 330.600 to provide increased control over avenues of entry of quarantine-significant wood-boring insects (in progress).

(4) For long-range planning, consider combining into one act the Plant Quarantine Act, the Organic Act, and the Federal Plant Pest Act.

C. Organic Act of September 21, 1944, (58 Stat. 735; 7 U.S.C. 147a).

(1) Amend the Organic Act to use the same definition of a plant pest as is used in the Federal Plant Pest Act. This would provide authority to carry out control or eradication programs on pests such as the giant African snail.

(2) Amend the act to provide authority for cooperative survey and control of pests in Canada and the countries in Central America. There is need to cooperate with these countries in the control, suppression, or eradication of such pests as the Mediterranean fruit fly.

(3) For long-range planning, consider combining into one act the Plant Quarantine Act, the Federal Plant Pest Act, and the Organic Act.

D. Mexican Border Act (January 31, 1942, 56 Stat. 40; 7 U.S.C. 149).

Make no change nor consider repeal until certain legal questions clear up through discussions with the Office of the General Counsel.

E. Terminal Inspection Act (March 4, 1915, as amended, 38 Stat. 1113; 7 U.S.C. 166).

Recommend retention. This act grants authority to States to request the U.S. Post Office to hold, for State inspection, mail containing plant material enroute to destinations within that State. A recent review by all States indicated that 12 States, the District of Columbia, Puerto Rico, and the Trust Territories of the Pacific desired continued use of the act within their jurisdictions.

F. Mexican Pink Bollworm Act (October 6, 1917, 40 Stat. 374; 7 U.S.C. 145).

Repeal this act because it duplicates the authority also provided by the Organic Act of the Department of Agriculture of 1944 (7 U.S.C. 147a).

G. Incipient or Emergency Control of Pests (April 6, 1937, as amended, 50 Stat. 57; 7 U.S.C. 148-148e).

(1) Amend to redefine "plant pest" to use the same definition as the Federal Plant Pest Act. This is very important since the authority to conduct control operations for pests, such as giant African snail, is not now included in the current act.

(2) Amend to include authority to cooperate with Central American countries in reference to pest survey and control activities.

H. The Golden Nematode Act (June 15, 1948, 62 Stat. 442; 7 U.S.C. 150-150g).

Recommend that the Office of General Counsel be contacted and, if they agree that the authority to promulgate quarantines for nematodes as plant pests exists under the Plant Quarantine Act, to prepare a written opinion confirming the decision. The Golden Nematode Act could then be repealed. If a favorable opinion is not given by OGC, the act should be retained.

I. Cooperation with States Act (September 28, 1962, 76 Stat. 663; 7 U.S.C. 450).

Retention of the act as now written.

J. Halogeton Glomeratus Control Act (July 14, 1952, 66 Stat. 597; 7 U.S.C. 1651-1656).

Recommend termination of the act. The proposed Federal Noxious Weed Act would repeal the act and provide authority for carrying out controls should future action be deemed necessary.

7. Mathematical models have already had a small beginning in the field of biological sciences and plant pest control. The California Department of Food and Agriculture is pioneering in this field. It is recommended that those concerned with model construction on the PPQ staff continue their efforts in the development of an acceptable formula for pest entry prevention.

8. The Chief Staff Officer of Regulatory Services (PPQ) should make a determination as to whether Limited Destination Permit, PPC 5-50, should continue in use. At present this form is used only in a limited area of the New England States.

9. Transit Inspection:

A. The concept of transit inspection should be defined in specific and clear terms in the 805 guideline memoranda.

B. Develop a nationwide statistically designed sampling plan for transit inspection.

C. The two positions for transit inspector coordinators currently assigned to the program should be abolished after the biometrically designed inspection system becomes operational.

D. Establish a position on the staff of Regulatory Services (PPQ) to handle staff details connected with a nationwide transit inspection system.

E. Place the responsibility for transit inspection with the Regional Directors and State Supervisors. The biometrically designed sampling system would be carried out with the current staff in each State. No additional personnel are required to implement this program.

F. Improve the information program for the general public and regulated industries.

G. The limited transit inspection program being conducted by Port Operations (AQI program) should be discontinued.

10. Procedures for reporting and investigating quarantine violations are contained in PPD Memorandum No. 805.4 dated May 12, 1967. This memorandum outlines the responsibilities for reporting and investigating apparent violations of Federal domestic plant quarantines. At the present time, approximately 1,000 violations are reported to Hyattsville headquarters annually. Less than 10 are ever forwarded to the Department of Justice for prosecution. The reporting of violations for minor infractions of the quarantine is burdensome and time consuming for field offices. It is recommended that

instructions on quarantine violations be revised to allow more discretion to be made at the field level as to the type of violation that should be forwarded to headquarters' Regulatory Services Staff for prosecution.

11. Section 106 of the Federal Plant Pest Act authorizes the Secretary to promulgate emergency regulations when a new plant pest is discovered that requires Federal regulatory action. The problem here is how to determine what constitutes an emergency and how long emergency operations should be in force before a public hearing is held under Section 8 of the Plant Quarantine Act. There is some question as to whether PPQ is using emergency regulations within the intent of the Federal Plant Pest Act. It is recommended that a clearly defined policy concerning the use of emergency regulations be established in consultation with the Office of the General Counsel.

12. Federal quarantine regulations serve as a legal document and are written in language that is difficult for field personnel to understand and interpret. It is recommended that official Federal quarantine regulations be supplemented by a simplified version written in lay language which would be issued to all field personnel and the using public.

13. The basic responsibility for establishing regulated areas lies with the District and State Supervisors. In most cases, as a matter of convenience, regulated areas are established on political subdivision boundaries. It is recommended that more consideration be given by responsible officials on establishing regulated areas on the basis of ecological zones or trade areas.

14. There are a number of instances where compliance agreements and establishments are being checked as frequently as once per week. If frequent checks are indicated, the intent of compliance agreements is not being met, and the management should make a determination as to whether the establishment should be continued under the compliance agreement. As a general guide to management, compliance agreements that need to be checked more than once each quarter should be revoked.

15. How effective are plant quarantines? The answer to this question is largely a matter of opinion. Effectiveness of plant quarantines has largely been based on negative information. If the pest is held in check, the quarantine receives the credit. However, many other factors may have been involved. There has been no accurate way to evaluate all contributing factors. Measuring the usefulness of quarantines is difficult. As we look to the future, more and more people are going to be demanding proof that restrictions placed on people and things are, in fact, contributing to control of the pest. It is, therefore, recommended that the problem of measuring effectiveness of plant quarantines be tackled. It is recommended that a study group be formed to deal with this subject. Among the disciplines to be represented on this study group, there should be an economist for cost-benefit relationship, a statistician for designing sampling or inspection techniques, a subject matter specialist, an ecologist, and a regulatory specialist.

16. Recommend that the Chief Staff Officer for Regulatory Operations, through the Regional Director, hold regional regulatory workshops for key Federal and State inspectors as a means of coordinating and updating information and procedures with respect to regulatory operations.

17. Several State plant board officials and members of the State Horticultural Inspectors Association have expressed interest in participating in PPQ training at Battle Creek, Michigan. It is felt that State inspectors attending the PPQ Training Center courses would help unify and coordinate State regulatory operations. Two training courses could be made available to cooperators (depending on the number requesting training and the availability of facilities):

A. The present course designed to train new PPQ inspectors in the identification of foreign pests and diseases.

B. A special course that would be primarily concerned with Federal laws, regulations, and procedures.

RECOMMENDATIONS BY STUDY GROUPS

The following contains a summary of the recommendations that were made by each study group. Their complete reports are too voluminous for inclusion herein. However, they are available upon request from the Office of the Director, Programs Development and Application, Plant Protection and Quarantine Programs, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Federal Center Building 1, Hyattsville, Maryland 20782.

Black stem rust--quarantine no. 38

The Black Stem Rust Quarantine was promulgated in 1919. The quarantine was subject to special reviews by Mr. M. E. Turner in 1971 and Mr. M. A. Campbell in 1972. Federal eradication of rust-susceptible plants began in 1918 following a severe stem rust epidemic. Barberry eradication has been conducted in all of 16 and portions of three States. Quarantines regulating interstate shipment of rust-susceptible barberry, Mahonia, and Mahoberberis apply to all conterminous States.

Program Objective

To eradicate rust-susceptible Berberis, Mahoberberis, and Mahonia plants in the present grain-growing areas of the United States.

Recommendations

1. Concentrate rework in areas that have the highest potential for stem rust spread and place completed territory on maintenance.
2. Continue regulatory efforts at the required level to exclude rust-susceptible or questionable Berberis, Mahoberberis, or Mahonia bushes from interstate movement.
3. Make adequate rust surveys to determine prevalence and severity of rust infection and to identify rust races.
4. Change the name from barberry eradication to black stem rust control. This will be in line with the name of the quarantine and with recommendations and objectives.
5. Exempt from certification rust-resistant Berberis, Mahoberberis, and Mahonia that have been inspected and found to be rust resistant after at least 2-year's growth.
6. Amend Quarantine No. 38 to allow articles in item 5 above to be exempt from certification or permit.
7. Change is recommended in 805-01.2200, "Black Stem Rust Inspection Requirements and Procedures," as follows: "To give protection to eradication States, certifiable plants must be grown where the environs up to 1/2 mile, based on probable risk, are free of all rust-susceptible Berberis, Mahoberberis, and Mahonia plants."
8. In 805-01.2200, paragraph 2, the word "annual" should be deleted and the sentence should read: "The inspection of Berberis, Mahoberberis, and Mahonia nursery stock is designed to prevent the reintroduction and subsequent distribution of susceptible stock into the eradication areas." This will bring the manual in line with a recent memorandum on this subject.

9. Guidelines No. 805.2, "Compliance Agreements," VII REVOCATIONS AND AMENDMENTS, paragraph 2, should be revised to read: "Compliance agreements should be amended and reviewed as needed. This will keep the document current with revisions of quarantine requirements. If the stipulations do not need to be revised, a dated notation of the review should be made on the reverse side."

Fruits and vegetables from Puerto Rico or Virgin Islands--quarantine no. 58

Quarantine 58 was established on July 1, 1925, to prevent the entry into the continental United States of certain plant pests known to occur in Puerto Rico.

Preclearance inspection is given to aircraft, baggage, and cargo departing Puerto Rico for destinations south of Washington, D.C., (south of the 39th parallel) plus all of California. Military flights are precleared to all mainland destinations. PPQ and U.S. Customs Service provide clearance to all aircraft departing for the mainland from the U.S. Virgin Islands.

Fruits and vegetables moving from Puerto Rico or the U.S. Virgin Islands are cleared at origin as follows:

1. Mangoes--fumigation and certification.
2. Pod beans and okra to northern destinations--inspected and certified. Okra must be for immediate processing or consumption.
3. Citrus (to southern ports), corn, and peppers--certified based on pest findings.
4. Pineapples--released under compliance agreement (PQ Form 60).
5. Fruits and vegetables in 7 CFR 318.58-3(b), inspected and released based on pest findings.
6. Cactus from the U.S. Virgin Islands--fumigated when presented for movement.

Household effects are cleared by owner signing PQ-24 (Shipper's Declaration) stating that regulated items are not being shipped.

Mail is screened by Commonwealth Department of Agriculture at Mayaguez, Ponce, and San Juan for southern destinations. Further screening is done at mainland ports of entry.

Program Objective

To quarantine Puerto Rico and the U.S. Virgin Islands to prevent the spread of certain dangerous insect infestations not heretofore widely prevalent or distributed within and throughout the United States.

Recommendations

1. There is a lack of current pest survey information in Puerto Rico. It is recommended that PPQ personnel, in cooperation with university personnel, conduct an immediate pest survey. Upon completion of the initial survey, a continuing trapping and survey program should be established.

2. Quarantine 58 is specific to insects. It is recommended that "plant pest," as defined in the Federal Plant Pest Act, be incorporated into Quarantine 58 in place of "dangerous insects" as listed in 7 CFR 318.58(a). (This would eliminate the need to list plant pests by name.)

3. Cactoblastis cactorum is now present and widely spread in Puerto Rico. Under present regulations, only cactus from the U.S. Virgin Islands is regulated. It is recommended that fumigation be required as a condition of movement of Opuntia spp. plants and plant parts from Puerto Rico, as well as the U.S. Virgin Islands to the continental United States.

4. Fruits and vegetables moving by surface vessel are inspected prior to shipment from Puerto Rico and the U.S. Virgin Islands. There is a problem with this system in that it is difficult to ascertain that all regulated materials are cleared prior to departure. Also, since cargo is containerized at various island locations, it is difficult to make an adequate inspection. It is recommended that Quarantine 58 be amended to require mandatory manifesting, inspection, and release at port of discharge on continental United States for all produce not requiring mandatory treatment. Produce requiring mandatory treatment will be treated and certified at origin.

5. Recent spot checks have revealed large quantities of mangoes being moved in passengers' baggage to northern ports. Cargo shipments of mangoes are fumigated prior to shipment to the mainland. It is recommended that there be a system of limited permits to allow shipment of mangoes to ports north of the 39th parallel without fumigation. The present fumigation requirement would apply to shipments destined to areas south of this line. Section 318.58-3(d) of 7 CFR should be amended to include the latest treatment schedule.

6. Okra moving from Puerto Rico and the Virgin Islands is inspected and certified to northern destinations for immediate processing or consumption. It is recommended that okra be allowed free movement in the United States to points north of the 38th parallel. (Okra regulations in Quarantine 58 should be consistent with okra regulations in Pink Bollworm Quarantine No. 52.)

7. Compliance agreements:

a. Under present administrative regulations concerning compliance agreements for vessel stores, there are no provisions for shipowners to sign a compliance agreement to preclude boarding on arrival by PPQ. There are certain situations whereby carriers (vessels and aircraft) could execute an agreement without unduly increasing the pest risk.

b. Pineapples are presently moving under compliance agreement.

c. We recommend the use of compliance agreements with carriers and for other produce such as cucumbers.

8. We recommend that the portions of Quarantine 30 (sweetpotatoes) pertaining to Puerto Rico be deleted and placed in Quarantine 58.

9. We recommend that the inspection of passengers' baggage and cargo destined to areas south of the 39th parallel be strengthened. This will require additional staff. Subprofessional employees should be hired to work under the supervision of professional personnel.

10. Quarantine 58, paragraph C, places no restrictions on the movement of fruits and vegetables between Puerto Rico and the U.S. Virgin Islands. Certain items prohibited entry into Puerto Rico may enter the U.S. Virgin Islands and be reshipped into Puerto Rico. We recommend that entry requirements for fruits and vegetables under Quarantine 56 be the same for the U.S. Virgin Islands and Puerto Rico.

11. Several State officials and representatives of industry have expressed concern with the movement of propagative material and cut flowers into the mainland from Puerto Rico. Presently, these materials move under Commonwealth Department of Agriculture certification based on periodic inspection of nurseries. We recommend that a review of regulations concerning these materials be made.

Golden nematodes--quarantine no. 85

The golden nematode quarantine was promulgated in 1969. The nematode was first discovered on Long Island, New York, in the United States in 1941. Since it was confined to a small localized area in New York, no Federal quarantine action was necessary since the New York Department of Agriculture and Markets had in force an effective State quarantine. Federal regulations were not imposed until a single field was found infested in Delaware in 1969. This infestation was subsequently eradicated, and Delaware was removed from the quarantine in March 1970.

The golden nematode quarantine has, perhaps, been one of the most rigidly enforced regulatory programs ever conducted. Due to the nematode's small size and ease of movement in commodities originating on the farm, it has been necessary to impose unusually strict regulations to prevent its long-distance spread. In the 32 years that the program has been in effect, there has been no known long-distance movement. The only two isolated infestations have been the finding of an infestation in Steuben County, New York, in 1967, and in New Castle County, Delaware, in 1969. Both infestations are, perhaps, the result of early movement of farmers from Long Island to these locations.

Since 1946, there has been an annual indepth review of the regulatory, control, and survey activities associated with this program. This review has been made by scientists at Cornell University, the Agricultural Research Service, the State of New York, and Federal regulatory officials. Since 1946, many changes have been made in regulatory, control, and survey procedures to update and make more effective program operations. The golden nematode program was reviewed by a special appraisal team in August 1972. The program was again reviewed in May 1973 by the quarantine study group. No changes in the regulatory program are recommended.

Gypsy moth--quarantine no. 45

The first gypsy moth quarantine was enacted in 1912. It was revised and renumbered in 1920 as Quarantine No. 45. This insect was first found in the United States in 1869, and control was started in 1889. The Federal program was inaugurated in 1906. The quarantine and associated control activities have been effective in confining infestations to the New England area, eastern New York, Pennsylvania, and New Jersey. However, in recent years there has been a rapid spread of the gypsy moth to the South and West which is a cause for concern. Detection of male moths in several noninfested States is attributed to the increased use of recreational vehicles moving out of the infested areas that carry the insect. A biometrically designed survey is in effect in areas of major concern to determine new areas of infestation. A quarantine evaluation study was conducted in 1972 to provide basic data about the recreational vehicle problem. Over 13,000 recreational vehicles were inspected, and about 1 percent had evidence of infestation. The Federal quarantine listing, regulated areas was revised effective January 5, 1973, adding to the regulated area, all or parts of 21 counties in New York, 15 in Pennsylvania, and 2 in Maryland. One county in Delaware and two in Maryland were placed under Federal regulation in 1972.

Program Objective

To prevent or retard artificial spread of the gypsy moth in the United States and Canada and to eradicate isolated infestations when feasible.

Recommendations

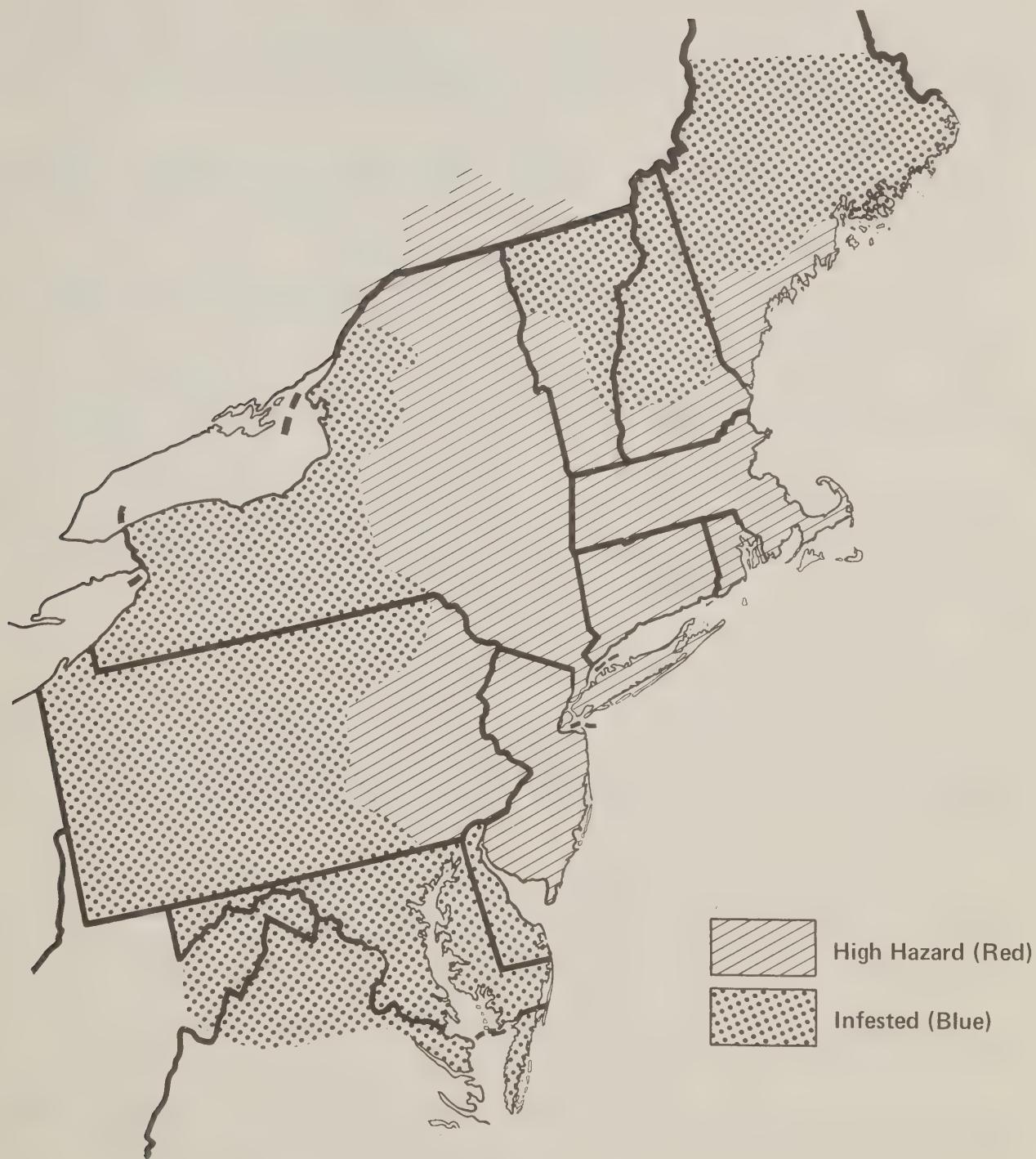
1. Make and promptly implement a plan to systematically survey the entire susceptible area of the United States to determine whether there is continuing need for a gypsy moth quarantine.

2. Prompt implementation of the two-stage quarantine. As developed by the study group, the regulated area would consist of two areas (see map):

- A. One area, referred to as the blue area, represents the periphery of general infestation in the United States. This area contains light infestation or is in imminent danger of infestation. Its outer boundary would be the limit of general infestation as shown by male moth recoveries in a systematic survey. The inner boundary would be a predetermined line abutting an area of heavier infestation.

- B. The outer area, referred to as the red area, contains egg masses that can be found with frequency (generally) in proximity to regulated establishments or articles. In drawing area boundaries, consideration will be given to civil subdivision lines and trade and travel patterns. An island of red area may be delineated within the blue area if a "hot spot" of sufficient size is discovered, such as a county or township having high hazard conditions. Where the geographic area is small and number of regulated activities are limited, Notice of Quarantine Action (premise quarantine) would be used in lieu of red designation.

TWO-STAGE GYPSY MOTH QUARANTINE



Restrictions are imposed on the movement of regulated articles from a regulated area as follows:

1. Certificate or permit required to move from red into or through white: there is no restriction on movement from red to blue (except when requested by an inspector at destination).
2. From blue into or through white when required by an authorized inspector.

C. Boundaries of the red-blue area would be established annually following a field evaluation by a selected committee of Federal-State personnel and subsequent consultation with the Chief Staff Officer of Forest and Soil Pests (PPQ). The committee's recommendations of revision in regulated areas would go to the Chief Staff Officer of Regulatory Operations (PPQ) for publication in the Federal Register by January 1.

D. As conceived by the study group, restrictions imposed on movements of regulated articles in the two-stage quarantine concept would be as follows:

(1) Certificate or a permit required:

(a) Moving from red area (high hazard) into or through a noninfested area.

(b) Moving from blue area (minimum hazard) into or through noninfested area where required by an authorized inspector at origin.

(c) Moving from an area (under State regulation only) into or through noninfested area.

(2) No restrictions on movements from red area into blue area unless certification requested by an inspector in blue area.

3. Review program to determine funding and staffing needs for the revised regulatory (two-stage quarantine) approach.

4. Establish criteria for placing area under regulation. (The two-stage quarantine proposal provides for this.) Exert strong Federal leadership to see that these criteria are uniformly applied in all affected States. State regulatory officials have commented on the need for firm Federal action in this matter.

5. Increase methods development effort or redirect existing methods efforts to produce a quick, effective, and usable treatment for recreational vehicles and mobile homes. This is the primary technical need on the regulatory program.

6. Accelerate efforts to correlate pheromone trapping survey results with the occurrence of egg mass infestations.

7. Improve survey planning. Make long-range plans to provide continuity of effort from year to year.

8. Train line supervisors in basic biometric concepts.

9. Make a thorough cost-benefit evaluation of the gypsy moth program.

10. Continue the regulatory evaluation survey of recreational vehicles as a means of measuring program impact on the incidence of gypsy moth transported by these vehicles. Develop methods for making similar surveys of all classes

of named (and suspect) regulated articles and conveyances to provide hard data about regulatory program effectiveness.

11. Establish a criterion to define what constitutes an "isolated infestation," and develop a set of uniform procedures for treatment of such infestations.

12. Do not apply or recommend the application of unproven control methods to "isolated infestations." We refer to such methods as sterile male release, pheromone confusion techniques, and saturation trapping.

13. Rewrite the gypsy moth manuals and guidelines. Establish a regular schedule for review and updating of these documents.

14. Critically review the restricted destination permit system.

15. Clarify guidelines for limited permit/certificate use regarding mobile home movement.

16. Notice of Quarantine Action, which is signed by the Director, Programs Development and Application (PPQ), and the State cooperator, is being handled at present on a form letter basis. It is recommended that the Notice of Quarantine Action be made an official PPQ form.

Hawaiian fruits and vegetables--quarantine no. 13

The Hawaiian Fruits and Vegetables Quarantine was first established on September 18, 1912, under the title of Mediterranean Fruit Fly. On May 1, 1914, the quarantine added another pest and was called the Mediterranean Fruit Fly and Melon Fly Quarantine. Effective June 24, 1948, based on discovery of the oriental fruit fly, as well as the presence of other injurious insects and plant diseases, the quarantine was revised and renamed the Hawaiian Fruits and Vegetables Quarantine. The procedures developed under the revised quarantine were designed to prevent the entry of several designated pests on fruits and vegetables likely to be moved to the U.S. mainland.

Quarantine 13 lists 10 insect pests that occur in Hawaii and are not established or widely distributed in other parts of the United States, offshore territories, or possessions. Three major fruit flies are included. Hawaii's agricultural economy is primarily based on sugarcane, pineapple, and livestock. The listed pests and dates first reported in Hawaii are Mediterranean fruit fly (1910), oriental fruit fly (1945), melon fly (1895), green coffee scale (1905), bean pod borer (1922), bean butterfly (1882), Asiatic rice borer (1927), mango seed weevil (1905), Chinese rose beetle (1896), and cactus borer (1954). These pests do not significantly affect Hawaii's major crops.

Quarantine 13 enforcement has been diligent throughout the years. However, it has not been completely effective in stopping the movement of infested host material from Hawaii. In recent years, it has been, at best, a suppression of the volume of fruit fly host material moving from Hawaii to areas favorable for fruit fly introduction.

Predeparture inspection in Honolulu began in 1938 with the inauguration of the transpacific service using the flying boats. This was a very small operation with three flights a week of approximately 20 passengers per flight. This work was handled by one inspector.

The real emphasis on predeparture inspection began after World War II. The two main reasons were the introduction of the oriental fruit fly, Dacus dorsalis (1945), and the beginning of volume air service between Hawaii and the conterminous United States which started to peak in 1948 with the use of DC-4's, then the DC-6's, and the Boeing Stratocruisers. The State of California, with its very large and vital agricultural economy, became tremendously concerned and exerted a powerful influence on the predeparture program.

Program Objective

The objective of the program is to preclude the spread of the 10 Quarantine 13 insect pests and other pests (i.e., giant African snail) from Hawaii to uninfested parts of the United States and U.S. offshore territories or possessions.

Comments

One of the major problems that has existed, and still exists in the port of Honolulu over the past 10 years, is that staffing has not kept pace with the volume of predeparture work.

The total staff in 1962 was 60 personnel, and the present staffing is 53 people. It has been recognized for several years that the Agency could not possibly keep staffing this program to meet the needs of the workload increases. Consequently, a number of innovations and changes in procedures and policy have evolved such as:

1. Mail inspection was changed by concentrating the inspection on mail destined to the 11 West Coast and Southern States.
2. Cut flowers and foliage were changed from individual inspection of each container to the procedure of compliance agreements and limited permits.
3. Surface cargo changed from individual inspection to the use of a certification, PQ Form 5 Declaration, which covers household effects, automobiles, and personal effects.
4. Use of L/A (local appointment) baggage aids was instituted to augment the staffing for the inspection of predeparture baggage.
5. Airline caterers were put under compliance agreements.
6. Companies purveying regulated fruits and vegetables were put under compliance agreements and limited permits.
7. In the spring of 1969, the most important change in this program was the implementation of selective baggage inspection.
 - a. The inspection force was unlocked from the carriers to a position where they could function from their own facility.
 - b. The concept from 100 percent inspection of baggage was changed based on a rationale of interrogating the passengers.
 - c. Decisions on whether baggage was to be inspected was based to some degree on the destination of the passenger. Northern destinations were felt to be of lesser risk.
 - d. Passenger hold baggage inspection to northern destinations during the period November 1 to March 31 was waived at the discretion of the inspector.
 - e. Tour group hold baggage inspection was waived to northern destinations during the period November 1 to March 31.

f. The inspection of flight crew baggage was discontinued, and the procedure was changed by execution of the "Inspection Agreement, Crew Baggage Predeparture Inspection Procedure" (AQI Form 74).

g. Inspection of hand baggage at the departure gate was discontinued about 1969 with implementation of selective baggage inspection which provided for all baggage at primary inspection point.

An overall problem which has existed since the program's inception is the need for more information about the adaptability of Quarantine 13 pests to become established in other parts of the United States. The information needed involves biological and ecological factors, as well as technology for detection and eradication once one of these pests becomes established.

We need the information mentioned in the above paragraph to intelligently modify the program on a sound biological basis. We have for some years been making changes which have been previously stated in the report, but no one could predict with any degree of accuracy the calculated risk involved.

Based on the information available to us at this time and the knowledge of the pests involved, there is some doubt in the committee's mind as to the potential pest risk of some of the insects mentioned in the quarantine. Our experience of the past 25 years indicates that some of the Hawaiian host material for these insects has repeatedly reached western mainland destinations, and yet we have never had an incipient infestation of any kind. The committee recognizes that the use of the excellent sex lure, methyl eugenol, to detect and eradicate male fruit flies has likely precluded the establishment of the oriental fruit fly in southern California.

Recommendations

1. Recommend that those sections of Quarantine 30 pertaining to Hawaii be included in Quarantine 13.

2. Recommend that the crew baggage inspection agreement be amended to include the "deadhead" crew members. This was the only request presented to us at the carrier meeting. Spot checks are being accomplished.

3. Recommend that compliance agreements be instituted with the carriers to cover all cargo accepted by them for transportation.

4. Recommend the use of L/A baggage inspection aids in the inspection and clearance of foreign-arriving conveyances, U.S. Customs Service standby of foreign baggage inspection, predeparture hand baggage gate inspection, and inspection of domestic departing aircraft. In all cases, the concept of L/A employee usage will be maintained, and the professional judgments will be made by a PQ Inspector.

5. Recommend that the States of Washington and Oregon be removed from the list of 11 States which is now used as a rationale for waiver and less stringent inspection procedures.

6. Recommend that the primary baggage inspection be drastically reduced throughout the year for passengers traveling to other than the States of Alabama, Arizona, California, Florida, Georgia, Louisiana, Mississippi, New Mexico, and Texas.

7. Recommend that certain local travel agencies be permitted to enter into compliance agreements which would allow for the year-round waiver of hold baggage inspection destined to States other than those mentioned in the above recommendation.

8. Any recommendations that are approved for implementation will be offered to the travel industry with the understanding that they will accept a greater degree of responsibility in assisting us in carrying out our program.

9. Recommend that treatment developed to eradicate fruit fly infestations in mangoes be authorized for use in Hawaii. It is recognized that this treatment does not eliminate the mango seed weevil. However, because the mango seed weevil appears to be of little economic significance since the seed is the only part of fruit normally affected by the Hawaiian seed weevil species, mangoes would be authorized for shipment into the United States with the exception of the State of Florida.

10. Recommend that information on population densities and locations for the melon and Mediterranean fruit flies be furnished us on a continuing basis. When population "hot spots" are noted, they should be treated. This recommendation supports our general concept to reduce the intensity of inspection.

11. Increase survey and detection programs for fruit flies in mainland susceptible areas receiving Hawaiian flights. This probably would be limited to southern California.

12. Recommend that periodic surveys be conducted at Hawaiian airports to determine fruit fly population. McPhail traps should be used with yeast, brown sugar, vinegar, and water.

13. Recommend that the baggage inspection aid, GS-1899-3, job description be revised so that L/A employees can be used on other inspection activities.

14. One of the most valuable assets to the predeparture baggage clearance operation is the information program. PPQ must look for better ways to inform the tourist, industry, and local public of the potential pest risk in Hawaii.

15. Recommend that roving inspectors be assigned to airport security checkpoints where hand baggage is inspected by security guards. Hand baggage carries the greatest plant pest risk in the predeparture baggage inspection program.

16. Quarantine 13 is specific to insects. It is recommended that "plant pest," as defined in the Federal Plant Pest Act, be incorporated into Quarantine 13 in place of "dangerous insects" as listed in 7 C.F.R., 318.58(a). (This would eliminate the need to list plant pests by name.)

Imported fire ant--quarantine no. 81

The Imported Fire Ant Quarantine was invoked in 1958. In the beginning, quarantine regulations were all inclusive in that they regulated almost any article of commerce that might harbor the insect in any stage of development. As more was learned about the imported fire ant program through research, field experience, and handling of commodities, the quarantine was changed and updated to delete items considered low risk. The most recent revision on regulated items was made in November 1972. The present approach, which includes treatment of regulated articles for certification, reduction of populations at potential dispersal points, and peripheral treatment of "hot spots," all designed to retard long-distance spread, is considered adequate. Many responses from workers, queried on the regulatory problems associated with the imported fire ant, pointed out the problems of hitchhiking gravid queens through automobiles, railroad cars, open trucks, and many other types of conveyances. This is recognized as a regulatory problem; however, it is also recognized that there is no feasible means of adequately dealing with this situation.

Program Objectives

1. To provide relief by control treatments to those people most adversely affected by the ant.
2. To prevent further spread by quarantine actions.
3. To determine limits by survey of infestation to be placed under quarantine.

Recommendations

1. Recommended revisions of regulated articles:
 - a. Soil, separately or with other things. No change.
 - b. Plants with roots and with soil attached. No change.
 - c. Grass sod. No change.
 - d. Hay and straw. No change.
 - e. Farm and construction equipment free of soil. Delete.
2. To regulate all infested areas on a contiguous basis as opposed to smaller separated infested islands of smaller size located nearby generally infested areas.
3. Peripheral survey is not adequate for establishing the outer limits of the quarantine line of the generally infested area. The present technique for delimiting survey is too confined and too costly. A biometric design is available for adaptation that is more accurate and less costly.

Japanese beetle—quarantine no. 48

The Japanese Beetle Quarantine No. 48 was enacted in 1920. Federal and/or State quarantine action is now operative in 23 States extending from Maine to Georgia and west to Missouri. Approximately 32,000 traps were in operation in 1972 to detect new infestations. Adult beetles were trapped for the first time in 36 counties in 12 States. The study group, based on all available data, feels that the Japanese beetle is nearing its ecological range. However, it is recognized that the insect may establish itself in certain favorable irrigated areas of the West. The vast amount of vehicular and aircraft traffic moving out of the infested area presents serious regulatory problems. This program should be given an indepth review to determine whether the costs involved justify the benefits being derived. The study group also has a serious question concerning the present-day economic significance of this pest to agriculture. The insect now seems to be a homeowner's problem.

Program Objective

To prevent or retard artificial spread to noninfested portions of the United States and Canada.

Recommendations

1. The quarantine should be continued until a comprehensive evaluation of economic importance can be completed. In this connection, a scientifically based data collecting system should be implemented immediately. This study should span two consecutive adult seasons and include both agricultural and suburban homeowner areas.

2. Recommended revisions of regulated articles:

- a. Soil. No change.
- b. Compost, decomposed manure, humus, muck, and peat. Delete.
- c. Soil samples without respect to size or end use. Delete.
- d. Plants, or plant parts thereof, when free of soil. Delete.
- e. Plants commonly known as house plants. Delete.
- f. Grass sod. No change.
- g. Plant crowns and roots for propagation. No change.
- h. True bulbs, corms, rhizomes, and tubers of ornamental plants when freshly harvested or uncured. No change.
- i. Used mechanized soil-moving equipment when free of soil. Delete.

3. "Pest-free" (not exposed to infestation) should be reinstated as a means of certification. Establishments should not be required to apply residual soil treatments when evidence of infestation is lacking.

4. Regulatory efforts should concentrate on vehicular movement as the primary source of artificial spread.

5. The potential ecological range of the Japanese beetle should be evaluated further to determine if past criteria and projections are still valid.

6. Use of milky disease as an integral part of local control plans should be encouraged.

Mexican fruit fly-quarantine no. 64

Mexican Fruit Fly Quarantine No. 64 (1927) was the subject of a special program appraisal completed April 25, 1973. The recommendations as submitted by the appraisal team were developed after consultation with State regulatory officials, research personnel, and representatives of industry. Recommendations include adjustments in the regulatory, survey, and control phases of the program in support of the present program objectives. The success of the sterile release technique on the California-Mexico border, the apparent permanent establishment of Mexican fruit fly in the Lower Rio Grande Valley of Texas, and recent changes in citrus marketing and processing practices require changes in program field operations to provide the flexibility needed in this era of rapid technological change.

Program Objectives

Prevention of spread to other citrus-growing areas, eradication of seasonally occurring infestations in northwest Mexico, and any new infestations that might be detected in the United States.

Recommendations

1. Change 7 CFR, 301.64, (b)(7) to read, "All citrus fruits except smooth skin lemons of commerce and sour limes."
2. The size of the regulated area as described in 803-00.9008 should be redescribed. The present description calls for a regulated area of 1 mile radius of a specimen recovery. Experience with recaptures of released marked sterile flies provides evidence that this is not adequate. It is recommended that the regulated area be extended a maximum of 5 miles beyond the infested area dependent upon the type of host material in the environs area. This redescription will bring Mexican fruit fly into line with Mediterranean fruit fly.
3. The limited permit used to identify untreated fruit not authorized transshipment to citrus-producing areas should be dropped. Compliance agreements were considered in lieu of the limited permit and rejected as necessary. Investigations have revealed that reshipment is negligible. Fumigated fruit is certified for movement to other citrus-producing States. Lack of certification identifies nonfumigated fruit.
4. Sterile releases should be made in the Lower Rio Grande Valley of Texas and adjacent areas of Mexico to reduce pest risk and possibly even eliminate the problem.
5. Initiate a study to evaluate the effectiveness of survey procedures.
6. Increase methods improvement and research to develop more efficient traps and attractants. This is considered the number one priority need of the program.

Pink bollworm--quarantine no. 52

Pink Bollworm Quarantine No. 52 (1921) was the subject of a special program appraisal during the period August 16, 1971, to May 10, 1972. The recommendations contained herein are the recommendations of this appraisal team.* Adjustments in program operations are recommended to support present program. Changes in regulated areas in the United States and Mexico, a shifting of movements of hazardous items, new processing practices as they relate to changes in the hazard involved, and new technology available combine to demand immediate revisions in field operations to compensate for different problems which are changing at an increasing rate.

Program Objective

To prevent spread to uninfested cotton-producing areas of the United States and determine technological feasibility of eradication.

Recommendations

1. Free movement be permitted on shipments going north of the 38th parallel.
2. A buffer zone should be established in the eastern part of Texas and Oklahoma where intensive regulatory and cultural control practices would be more apt to prevent eastward spread to noninfested areas. This should be coordinated with the suppressive and regulatory programs in the States of Arkansas and Louisiana. This zone would be developed through inputs from program personnel in the field. Westward spread to Southern California was reported in 1965, and the present sterile release program was initiated in the San Joaquin Valley in 1968. This valley, where over 90 percent of California's cotton is grown, is still free of economic populations.
3. Reduce the number of compliance agreements in regulated areas to include only those establishments shipping to noninfested cotton-growing areas.
4. Compliance agreements should be signed by the local inspector instead of the supervisor, and a copy should be retained for his records. Where more than one document has been issued for separate activities of the same establishment (sanitation, fumigation, etc.), they will be combined into one agreement.
5. It is recommended that compliance checks not exceed an average of four visits annually, except in unusual cases.
6. Make limited contacts with establishment not under compliance agreement to monitor operations. An exception to this would be in an established buffer zone.

* Recommendations for revisions of regulated articles and pink bollworm activities in Mexico were the subject of a special task force study in July 1973.

7. Discontinue lint cleaner inspections in the generally infested area. Limited checks may be made incidental to essential compliance visits to assist in monitoring populations.

8. Review the need for compliance agreements justified as necessary in order to furnish certificates in bulk. Responding to an occasional request for a certificate may be more practical than servicing an agreement and accounting for certificates.

9. Place emphasis on destination checks in the nonregulated cotton-growing areas. Quarantine evaluation surveys (transit inspection) should be increased using checks at irregular intervals by State or local Federal inspectors.

10. The storage of unused gin equipment for a 2-year period will be a basis for certification as an approved treatment. This will be included in the manual.

Recommended Revision of Regulated Articles

1. Cotton and wild cotton plants, including all parts of such plants. No change.

2. Seed cotton. No change.

3. Cottonseed. No change.

4. Cottonseed hulls. Delete.

5. Cotton lint. Delete.

6. Cotton linters. Delete.

7. Cotton waste produced at cotton gins, cottonseed oil mills, and cotton textile mills. Delete cotton textile mills.

8. Cotton gin trash. No change.

9. Used bagging and other used wrappers for cotton. Delete.

10. Used cotton harvesting equipment and used cotton ginning and cotton oil mill equipment. No change.

11. Okra and kenaf, including all parts of such plants, except canned or frozen okra. No change. However, it is recommended that a study be conducted to determine hazard of okra moving under varying conditions.

Rationale for Recommended Changes

Cottonseed hulls:

Research by O. T. Robertson, 1/ Entomology Research Division, 1964, concluded that no pink bollworms survived in hulls in a test using heavily infested cotton. Other research has verified these findings.

Cotton lint:

Reference is made to USDA, ARS Production Research Report No. 73,2/ issued in 1963 on "Pink Bollworm Kill with Improved Gin Equipment." Results of tests on survival in lint cotton are as follows: "The 90 pounds of lint collected before it passed through the lint cleaner contained five pink bollworms--all from the hand-picked cotton--of which only one survived the period for adult emergence. No live worms were found in 100 pounds of lint examined after it passed through the cleaners. This 100 pounds of lint represented seed cotton that contained an estimated 28,000 live worms before ginning."

Cotton linters:

Conclusive evidence from Mr. Robertson's research referenced above shows no survival in first or second cut linters or linter cleaner trash.

Cotton Waste Produced at Cotton Textile Mill:

Recommendations in this report are to discontinue regulating products that go to the textile mill. Therefore, there is no logic in regulating waste from same products.

Used bagging and other used wrappers for cotton:

No justification in retaining this item if we agree that baled cotton lint is no longer a regulated article.

References

1/ Robertson, O. T. 1964. Experiments to determine kill of the pink bollworm at the oil mill. Entomology Research Division, Brownsville, Texas. 6 pp. Parts of his report were taken from publication by O. T. Robertson, V. L. Stedronsky, and D. H. Currie. 1959. Kill of pink bollworms in the cotton gin and the oil mill. USDA Production Research Report No. 26. 22 pp.

2/ Robertson, O. T., D. F. Martin, D. M. Alberson, V. L. Stedronsky, and D. M. McEachern. 1963. Pink bollworm kill with improved gin equipment. USDA Production Research Report No. 73. 7 pp.

Unshu (Satsuma) Orange Quarantine No. 83

Unshu oranges grown in USDA supervised areas in Japan may be imported into the United States under provisions of Quarantine No. 83 which became effective July 3, 1967. The oranges may be imported into the States of Alaska, Hawaii, Idaho, Montana, Oregon, and Washington. They may not be transshipped outside of these States.

The Unshu orange is a select item available only during a few weeks between Thanksgiving and Christmas. It was once known as the "Christmas orange" in the Northwest where it was imported from 1925 to 1941. In 1947, however, USDA banned further importation of Unshu oranges from Japan to prevent the possible introduction of citrus canker disease, which had once existed in the United States but which had been eradicated.

In the fall of 1965, certain citrus importers in the Northwest petitioned USDA to resume the importation of Unshu oranges under specific safeguards. The petition was widely publicized and comments were invited. A public hearing was held in Washington, D.C., February 14-15, 1967, and, on the basis of testimony, USDA added several additional safeguards to those in the petition. Another public hearing was held in Portland, Oregon, April 19, taking into account these additional safeguards.

Unshu oranges can be imported only if grown in isolated areas of Japan determined by U.S. and Japanese scientists to be free of citrus canker. The fruit must be inspected before and at the time of harvest, during packing operations, and at the port of arrival in the United States.

Before packing, the fruit must be given a surface sterilization with an approved bactericide. It must be clearly identified on the tissue paper wrapping and the box as Japanese-grown Unshu oranges that may legally move into Alaska, Hawaii, Idaho, Montana, Oregon, and Washington. Just before loading, samples of the oranges must be given a "bacteriophage" test under USDA observation--a method that uses known viruses or "phages" that multiply in the presence of a particular bacterium and, therefore, indicates its absence or presence.

If any of these inspections disclose the presence of citrus canker disease, all fruits from the originating grove will be inadmissible.

Recommendations

There are seven dealers in Washington and six in Oregon under compliance agreements. These agreements are checked once each year. The records show that in calendar year 1971, 32,500 boxes of Unshu oranges were received at the ports of Seattle, Washington, and Portland, Oregon, and, in calendar year 1972, 63,000 cases were received at these ports. No violations of the quarantine have been reported. There are no recommended changes in Quarantine No. 83.

Whitefringed beetle—quarantine no. 72

The Whitefringed Beetle Quarantine No. 72 was enacted in 1939. The present program is directed primarily at maintaining regulatory services. Surveys were generally limited to the extent needed to support regulatory operations. Federal suppression or eradication efforts in new infested areas are conducted only if critical evaluation of each incidence indicates such action is desirable.

Program Objective

To prevent or retard artificial spread to noninfested parts of the country.

Recommendations

1. Uniform State and Federal quarantines should be adopted.
2. A uniform approach should be developed and utilized to determine the extent of economic damage being done by the whitefringed beetle both directly or indirectly.
3. Recommended revision of regulated articles:
 - a. Soil. No change.
 - b. Compost, decomposed manure, humus muck, and peat. Delete.
 - c. Plants with roots with soil attached. No change.
 - d. Grass sod. No change.
 - e. Plant crowns and roots for propagation. No change.
 - f. True bulbs, corms, rhizomes, and tubers when freshly harvested or uncured. Delete.
 - g. Peanuts in shells and peanut shells, except boiled or roasted peanuts. Delete.
 - h. Hay and straw. Delete.
 - i. Used cultivating and used harvesting machinery moving out of regulated area. No change.
 - j. Used soil-moving equipment moving out of regulated area. No change.
4. Regulatory should be adjusted to include more transit type inspections, particularly in partially infested States.

5. The whitefringed beetle regulatory treatment manual is outdated and should be completely revised to reflect the pesticide treatments presently approved.

Witchweed--quarantine no. 80

The Witchweed Quarantine was invoked in 1957 following the discovery of witchweed in 1956 in Columbus and Robeson Counties, North Carolina, and in contiguous areas of South Carolina. Infestations have been found in 36 counties in North Carolina and South Carolina. Witchweed has been eradicated in eight of these counties. From a regulatory standpoint, the witchweed program has been a highly successful undertaking. Its achievements have far exceeded the predictions made by many workers following its discovery. The combined regulatory and control efforts have kept this serious parasitic weed confined to a relatively small area for more than 15 years. It is significant to note that there has been no known long-distance spread.

The witchweed program was reviewed by a special appraisal team in September 1971. There were no changes recommended in the regulatory program at that time. The program was again reviewed in May 1973 by the regulatory study group and again no changes were recommended.

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APPENDIX I--NATIONAL PLANT BOARD PRINCIPLES OF PLANT QUARANTINE

1. Definition. A quarantine is a restriction, imposed by duly constituted authorities, whereby the production, movement or existence of plants, plant products, animals, animal products, or any other article or material, or the normal activity of persons, is brought under regulation, in order that the introduction or spread of a pest may be prevented or limited, or in order that a pest already introduced may be controlled or eradicated, thereby reducing or avoiding losses that would otherwise occur through damage done by the pest or through a continuing of control measures.

2. Basis in Logic. Since the ends to be attained by a quarantine and the measures required by it could not be undertaken by private individuals or groups, involving as they do restrictions on areas, persons, or activities for the benefit of wider interests or the public at large, resort to regulation imposed by public authority is logical.

3. Necessity. Establishment of a quarantine should rest on fundamental prerequisites, as follows: (1) The pest concerned must be of such a nature as to offer actual or expected threat to substantial interests; (2) the proposed quarantine must represent a necessary or desirable measure for which no other substitute involving less interference with normal activities, is available; (3) the objective of the quarantine, either for preventing introduction or for limiting spread, must be reasonable of expectation; (4) the economic gains expected must outweigh the cost of administration and the interference with normal activities.

4. Legal Sanction. A quarantine must derive from adequate law and authority and must operate within the provisions of such law.

5. Validity. A quarantine established for the purpose of attaining an objective other than that which it indicates or defines is open to serious criticism, even though the actual objective is itself desirable.

6. Public Notice. If the circumstances will permit, public notice of a proposed quarantine should be given and those interested should be invited to contribute facts in their possession, but if the objective would be defeated by the delay required for such notice and discussion, duly-constituted authorities should assume responsibility for the decision to impose or withhold quarantine action.

7. Scope. The extent of restrictions imposed by a quarantine should be only such as are believed necessary to accomplish the desired end, but on the other hand the objective of a quarantine should not be jeopardized by omission of any necessary restrictions.

8. Relation to Eradication. If a quarantine is imposed in order that eradication of a pest from a given area may be undertaken, the restrictions involved may properly be relatively extensive, because of the importance of the

objective sought, and because the time through which the quarantine will operate may be expected to be relatively limited.

9. Relation to Retarding Spread. If a quarantine is imposed for the purpose of limiting or retarding spread of a pest, but without expectation of eradication, the restrictions should be such as are in line with the objective of the quarantine and should recognize the fact that continuance of the pest in the area where it is established, or possibly its spread in time to new areas, is accepted.

10. Cooperating Authorities. Since quarantines usually involve relations between public authorities, such as those of the government of one country with that of another, or of Federal and State Governments, or of State Governments and local authorities, the cooperative relationship that is necessary to adequate enforcement should be clearly recognized and duly provided for.

11. Cooperation of the Public. Because of the fact that the success of a quarantine requires that its restrictions be fully maintained, it is essential that all persons who are affected by it adhere to its requirements. In order that this end may be attained the administration of a quarantine should seek the intelligent cooperation of the public affected, rather than depend exclusively on police powers, the imposition of penalties, or resort to court action.

12. Clarity. In order that a quarantine may be administered readily and consistently, it should be designed with care, should be phrased clearly, and should be made as simple as is consistent with legal requirements and the objective to be attained.

13. Information Service. Since the persons affected by a quarantine may not reasonably be expected to possess full or accurate knowledge of the circumstances that make it necessary, or the nature and importance of the aim sought, and since compliance with quarantine restrictions will be more complete if the objective and plans are understood, measures should be taken to set forth the conditions existing, the means to be employed, and the end to be attained, and these measures should be continued from time to time as the undertaking proceeds toward accomplishment.

14. Research. If an emergency requires the establishment of a quarantine before satisfactory biological data are available, provision should be made as soon as possible for extending the Fund of Biological Knowledge. The authority that exercises the right to establish the quarantine should command or secure the means for biological research, both in order that the quarantine may be made more efficient, and in order that the restrictions may be lessened where possible. The need for research, however, should not be permitted to delay the establishment of a quarantine believed by authorities to be desirable, thereby jeopardizing the objective that might otherwise have been attained.

15. Modifications. As conditions change, or as further facts become available, a quarantine should promptly be modified, either by inclusion of restrictions necessary to its success or by removal of requirements found not to be necessary. The obligation to modify a quarantine as conditions develop is a continuing obligation and should have continuing attention.

16. Repeal. If a quarantine has attained its objective, or if the progress of events has clearly proved that the desired end is not possible of attainment by the restrictions adopted, the measure should be promptly reconsidered, either with a view to repeal or with intent of substituting other measures.

17. Notices to Parties at Interest. Upon establishment of a quarantine, and upon institution of modifications or repeal, notices should be sent to the principal parties at interest, especially to Federal and State authorities and to organizations representing the public involved in the restrictive measures.

18. Use of Natural Boundaries. In defining the boundaries of a quarantined area, it is usually desirable to utilize State, county, or township lines. However, if a substantial natural feature, such as a mountain range or a large river, more correctly defines the actual area, such natural feature should be utilized in the description of a quarantined area.

EXPLANATORY NOTES

(Numbers refer to corresponding paragraphs in Statement of Principles)

(1) The purpose of this paragraph is to clarify thought in the minds of the public, to indicate the scope of plant quarantines, and to set forth briefly the what and why of a quarantine.

(2) The logical foundation for quarantine action is defined and attention is directed to the fact that private or group action cannot take the place of a regulation imposed by public authority.

(3) Four substantial prerequisites of quarantine action are set forth. It is believed that these four, as defined, are self-explanatory. Thus, if the pest concerned is not one which offers either actual or expected threat to substantial interests, it should not involve the machinery and restrictions of a quarantine. If some measure is available and presumably effective which is less costly or burdensome than a quarantine, that measure should be the one adopted. If the quarantine cannot be expected to accomplish anything its promulgation is questionable. If the economic gains from a quarantine are likely to be less than the cost of it, including the economic losses that it occasions, it cannot be defended.

(4) Promulgation of a quarantine which does not have behind it statutes or authority adequate to permit its enforcement is an invitation to annulment. Where such authority does not exist it should be sought.

(5) The purpose in this paragraph is to point out the danger inherent in a quarantine which, though presumably intended for control of a pest or similar purposes, is actually based on another objective, such as furtherance of trade.

(6) The principle is submitted that public notice of a proposed quarantine is desirable when possible, but on the other hand public notice should not be absolutely required, because occasion may arise when to delay until public notice can be given would mean defeat of a critically important objective.

(7) The principle here involved is one of adequate measures to accomplish the necessary end, but along with this the exercise of care not to impose unnecessary restrictions.

(8) and (9) An important distinction is set forth in these two paragraphs. It is submitted that a quarantine based on the hope of actual eradication of a threatening pest may properly involve more severe restrictions than those permissible in a quarantine which can hope only to retard spread. In the former case the objective to be gained is greater, the time through which the measure will prevail is presumably more limited, and the restrictions imposed may legitimately be more severe. In the latter case, the actual objective should be clearly understood and the measures adopted should be such as are allowable in view of the end sought.

(10) The cooperative relationships which are nearly always involved in a quarantine should be recognized and should be provided for in the measures proposed.

(11) The fact is here pointed out that a successful quarantine means complete adherence to its provisions on the part of all concerned. Since usually very large numbers of the public are involved, cooperation of the public should be sought.

(12) Quarantines have a tendency toward complexity. Sometimes this is inevitable. To meet this difficulty special effort should be made to phrase a quarantine order in the clearest and most logical language possible.

(13) The fact is recognized that any quarantine is likely to be criticized from time to time, and sometimes seriously so. Much criticism arises from an imperfect understanding of the objective of the quarantine and the necessity for its provisions. It is submitted, therefore, that constant and consistent effort should be made to keep the public advised as to the actual objectives of a given measure and the reasons why it imposes the restrictions that it involves.

(14) The purpose of this paragraph is to recognize, on the one hand, the fact that very often a quarantine must be set up before even reasonably complete knowledge of the pest concerned is available, and on the other hand, the fact that the study of the pest, and of many other phases of the matter, should go on, in order that wise improvements may be possible. These improvements may consist of additional necessary restrictions not appreciated at the start, or they may include relaxation of certain restrictions not found necessary.

(15) and (16) Just as there should be readiness to take prompt action in imposing restrictions, so also there should be readiness to take equally prompt action in relaxing them or repealing them, when the progress of events indicates such changes to be proper and safe.

(17) This is essentially a matter of helpful practice, based on the fact that various parties, including quarantine officers of other jurisdictions, should know promptly of any changes in the quarantine structure.

(18) In some instances where it appears that the use of natural boundaries are more convenient, and work less hardships on commerce, and at the same time adequately mark the boundary of a quarantined area, it seem advisable to use such boundaries.

Adopted by the National Plant Board in 1931.
Slightly revised 1936.

APPENDIX-II-PRINCIPLES OF PLANT PEST CONTROL

"Principles of Plant Quarantine" were adopted by the National Plant Board on July 25, 1931, and amended in 1936. Thirty years and many quarantines later, these principles appear to be just as sound today as when originally adopted.

It now appears desirable to supplement these principles with a set of basic definitions and general guidelines to be considered in preparing quarantines and supporting documents which should promote greater uniformity of plant quarantine actions throughout the United States.

The definitions and guidelines contained in this memorandum have been reviewed and approved by the regional plant boards. The National Plant Board, therefore, recommends that these definitions and guidelines be used to supplement the "Principles of Plant Quarantine." It is the belief of the National Plant Board that these definitions and guidelines should lead to greater understanding in the uniformity of quarantine procedures with resultant benefits to regulatory officials and individuals and concerns affected by such regulations.

Definitions of Terms

1. Certificate. An authenticated document, label, or stamp input affirming compliance with quarantine restrictions affecting movement of regulated articles, indicating that such articles are free of the live quarantined pest.

2. Compliance Agreement. A written agreement which a person engaged in growing, dealing in, or moving regulated articles may be required to sign, in which the person agrees to comply with conditions specified in the agreement on the basis of which a certificate or permit may be issued for movements of regulated articles.

3. Host. Any plant or plant product designated in the quarantine upon which the quarantined subject pest is dependent for completion of any portion of its life cycle.

4. Infested. Actually infested with the pest or so exposed to infestation that would be reasonable to believe that an infestation exists.

5. Inspector. An employee of the regulatory agency concerned or other person authorized by the agency or under basic State law to enforce the provisions of the quarantine and regulations.

6. Limited Permit. An authenticated document allowing the movement of specific regulated articles to a specified location for treatment, particular handling, or utilization.

7. Move. To ship, offer for shipment, receive for transportation, carry, or otherwise transport, move, or allow to be moved.

8. Person. An individual, corporation, company, society, or association or other business entity.

9. Pest. All living stages or the insect, disease, or other pest organism of plants or plant products against which the quarantine is directed.

10. Regulated Article. Any article of any character as described in the quarantine carrying or capable of carrying the plant pest against which the quarantine is directed.

11. Scientific Permit. An authenticated document allowing the movement of regulated articles or of the pest concerned to a specified destination for scientific purposes.

Types of Quarantine Action

Several types of quarantine action may be taken, depending upon the problems involved. These may be defined as follows:

1. Hold Order. An authenticated order or notice issued to the owner or person in charge or possession of a premise, plant, conveyance, or article infested or exposed to infestation, making it unlawful to move the specified article(s) set forth in the order or notice unless treated in accordance with prescribed procedures. If no less drastic procedures are available, the order may require destruction of the infested article. Hold orders normally are issued to take prompt regulatory action in emergencies. If continuing quarantine action is required, a formal quarantine should be invoked. Hold orders may be issued to retain necessary quarantine action on a few properties if eradication treatments have been applied and continuing quarantine action is no longer necessary for the majority of the regulated area.

2. Emergency Regulation. A regulation placed in effect without prior public notice in order to take immediate regulatory action.

3. Federal Quarantine. A quarantine invoked under provisions of the Plant Quarantine Act. There are two general types--those regulating domestic interstate movement and those regulating movements from foreign countries.

(a) Federal domestic plant quarantines are applicable to pests within the United States. Control over the movement of regulated articles is applied at source. Federal domestic quarantines apply only to interstate movement.

(b) Federal foreign quarantines are applicable to pests in foreign areas known to be infested. Control over movement is applied at the U.S. port of entry (except under special circumstances through special arrangement with the exporting country).

4. State Plant Quarantine. A quarantine adopted under authority of State law.

(a) State Interior Quarantine

A quarantine regulation adopted by a State against a pest of no apparent quarantine significance to any other State, to prevent spread of the

the pest within its borders; or one adopted by a single infested State against a pest of regional or national significance when no Federal domestic quarantine is adopted to prevent spread of the pest within and from the infested State.

(b) Parallel State Interior Quarantine

A quarantine regulation adopted by an infested State, against a pest which is not distributed throughout the State; and the pest is also subject of a Federal domestic quarantine, and it is desired to regulate only the infested portion of the State. Areas to be regulated should be described in both the State and Federal domestic quarantines and both quarantines should be parallel with respect to the basic requirements needed to prevent spread. The State quarantine regulates intrastate movement and the Federal quarantine regulates interstate movement from the regulated portion of the State. Such quarantine action is required if the Federal quarantine is to apply only to the infested portion of the State.

(c) Uniform State Quarantine

A quarantine or regulation adopted by two or more infested States which are parallel with respect to their basic requirements. The regulated area in each such uniform State quarantine should describe the area to be regulated in the issuing State and should include a reference to regulated areas of all other infested States under uniform State quarantine. If a pest of regional or national significance occurs only in limited areas of one or a few States and no Federal domestic quarantine is anticipated, an effective State Interior Quarantine adopted by a single infested State [see (a) above], or the adoption of Uniform State quarantines by all infested States, which will control both intrastate and interstate movements from all known infested areas, is preferable to the adoption of Standard State Exterior Quarantines [see (d) below] by all other noninfested States.

(d) Standard State Exterior Quarantine

A quarantine regulation adopted by a noninfested State. If the pest is widespread in distribution and involves several States, it may be more practical for the noninfested State(s) to invoke regulations requiring such controls at destination as are necessary to provide protection to their industry. In cases where two or more States take quarantine action against such a pest, it is recommended that there be agreement and that similar action be taken by all States adopting or maintaining a quarantine against the particular pest. Such quarantines should be referred to as Standard State Quarantines.

Operating Principles

1. Reporting New Pests. State regulatory officials should immediately report new plant pest discoveries within their State to the Plant Protection Division and regulatory officials of other States as he deems necessary. The report should include the name of the pest, identifier, and location of the find. Quarantine action or other safeguard measures being taken to prevent spread while the infestation is under investigation should be indicated. In

this initial notification, the statement may simply indicate that all pest carriers, including host products, are being properly safeguarded before movement is allowed from the infested area either by the State regulatory personnel alone or in cooperation with the Plant Protection Division. Immediately upon receipt of the report from the State regulatory official, the Plant Protection Division shall inform all States concerning the discovery and include in the report other available information, such as potential importance and actions that may be considered by other regulatory officials. As additional information develops, followup reports should be submitted through the same channels to keep all State regulatory officials properly informed.

2. Notification. Quarantine action taken prior to public notice should be brought to the attention of all concerned regulatory officials immediately. If a Federal quarantine is in effect against this pest or a Federal quarantine is anticipated, all State regulatory officials should be informed and the affected State(s) consulted prior to making any announcement of action anticipated to adopt, amend or repeal such a quarantine. It is recommended also where Standard State Exterior Quarantines are applied that other regulatory officials be informed of anticipated amendments or revocations.

3. Federal Precedence. Biologically sound Federal quarantines take precedence over State regulations against the same pest. However, any State may adopt a quarantine or regulation against a pest or an area not covered by a Federal quarantine. Any State may seize, destroy, or require treatment of products moved from a federally regulated area if they were not moved in accordance with the Federal quarantine regulations or, if certified, they were found to be infested with the pest organism.

4. Pest Eradication. It may not be necessary to adopt or amend a Federal quarantine to include a State that is known to be infested, provided the State is taking necessary quarantine action under its State law and is applying eradivative measures independently or is participating with the Federal agency in treatments to control or eradicate the pest. In such instances, State officials should adopt a specific quarantine or regulation which provides for the same control over the movement of regulated articles as is provided for in the Federal quarantine. The State also should, in cooperation with the Federal agency, conduct necessary surveys to detect, delimit, and suppress populations.

5. Uniform Quarantines. If all States known to be infested with a pest adopt uniform quarantines, which provide protection to all noninfested States as well as to noninfested portions of the infested States, noninfested States should not invoke a quarantine against the infested States. By mutual agreement, Federal regulatory agencies may participate with State regulatory officials in the enforcement of Uniform State Quarantines and State Interior Quarantines directed against pests of regional or national significance.

6. Treatments and Safeguards. Before adopting or amending any treatment or safeguard procedure to be utilized in a Federal domestic plant quarantine, there should be agreement between the affected State regulatory officials and the Federal agency. Likewise, treatments and safeguard procedures to be utilized in State Uniform Quarantines and State Interior Quarantines directed against pests of regional or national significance should be agreed upon by

all States adopting such regulations and with the Plant Protection Division if it participates in the program directed against the pest. Agreement between State regulatory officials also is desirable for Standard State Quarantines.

7. Interstate Shipments. Any regulated article that is prohibited interstate movement or is required to be certified, if moved interstate from a regulated area by a State or Federal quarantine at source, should be refused by any destination State regulatory official if so moved in violation of, or not certified in accordance with, the quarantine in effect at the source. If only a portion of the source State is under such a State or Federal quarantine at source, the destination State regulatory official should not refuse or require a certificate on any such article moved interstate from any non-regulated portion of the source State, unless the article is found to be infested or is prohibited or required to be certified under a specific quarantine of the destination State. The owner or carrier of regulated products which are reportedly originating in nonregulated portions of a quarantined State must provide proof of origin of the regulated products through an invoice, waybill, or other shipping document to the satisfaction in the receiving State regulatory official.

Basic Provisions for Inclusion in Quarantines

1. A notification of the quarantine and quotation by authority.

2. Name of pest organism.

3. List of regulated articles. The list should include the specific hosts and articles with which the pest organism definitely may be associated, and provide for the regulation of any other article the movement of which may present a hazard of spread whenever such a hazard has been determined by an authorized inspector, and when the owner or possessor thereof has been so notified.

4. Provisions for exempting articles from specified requirements. Certification or treatment may be waived for certain articles under specified conditions. These may be specified in a separate document or in the listing of regulated articles, whichever procedure is the most feasible.

5. Description of Regulated Areas. Depending upon the nature of the pest and known distribution, the regulated area to be described in the quarantine may involve the entire State, portion(s) of the State (areas), or list of names and locations of infested properties.

(a) Regulated areas may be subdivided into suppressive and generally infested areas in those quarantines where it is desirable to augment suppressive or eradication measures being applied in certain areas, and it is believed necessary to control movement into such areas from generally infested areas.

(b) Wherever basic laws provide the authority to do so, it would be desirable to include provisions in the quarantine for adding to the regulated area any other area known to be infested, or which is found to be infested

after adoption of the quarantine, when so declared by the authorized regulatory official through publication of a notice to that effect in local newspapers or through direct written notice to affected property owners or by other legally prescribed procedures.

(c) When it is determined that infestation in a certain regulated area has been eliminated through the application of treatments, to the extent that movements of the regulated articles therefrom would no longer present a pest risk, except movement from a few remaining infested properties in the area which can be controlled by the regulatory official of the source State by serving a written hold order on each owner of an infested property, the quarantine may be lifted on such a regulated area, and it should not be necessary to list in the quarantine the names and locations of the infested properties under hold order. Another approach would be to exempt such areas from specified requirements until eradication had been achieved.

6. Conditions governing the movement of regulated articles from or within regulated areas.

(a) Certificates or permits should be required for the movement of nonexempted regulated articles when:

- (1) Moving from a regulated area to any point outside thereof.
- (2) Moving from a generally infested area into a suppressive area.
- (3) Moving within a suppressive area where such control over this movement is desirable.

(b) Certificates or permits should not be required for any regulated article originating outside of a regulated area moving to another nonregulated area, or moving through or reshipped from a regulated area when the point or origin of the article is clearly indicated on a waybill, bill of lading, shipper's invoice, or other similar document accompanying the shipment, provided that shipments moving through or being reshipped from a regulated area must be safeguarded against infestation while within the regulated area in a manner satisfactory to an inspector.

(c) Certificates should not be issued unless provisions of other applicable quarantines have been met and the regulated articles:

(1) Originate in a noninfested portion of the regulated area and have not been exposed to infestation while within the regulated area; or

(2) Have been examined and found to be free of infestation (This method of certification should not be allowed on certain programs if it is impossible to visibly determine whether the pest is present--i.e., nematodes, witchweed seed, etc. The thorough cleaning of a product is an authorized treatment procedure but the examination of such product after cleaning is to determine whether it is cleaned and not to visually inspect it for the pest.); or

(3) Have been treated in accordance with approved procedures; or

(4) Have been grown, produced, manufactured, stored, or handled in such a manner that, in the judgment of the inspector, no infestation would be transmitted thereby.

(d) Limited permits may be issued to allow the movement of regulated articles to a specified destination for limited handling, utilization, or processing, provided the inspector has determined that such movement will not result in the spread of the pest and requirements of other quarantines have been met.

(e) Control over the movement of regulated articles from infested premises to noninfested areas within a regulated area may be provided for when such control over movement within a regulated area is desired to prevent pest spread. This provision usually will be applicable only when eradication treatments are being applied and would be handled through a direct written notice to the property owner concerned.

(f) Compliance agreements should be required as a basis for the issuance of certificates or permits in bulk to industry for their issuance, and they are desirable to explain the main provisions of the quarantine for that particular concern.

7. Provisions for movement under permit for scientific purposes.

8. Waiver of liability of any damage to any regulated products as a result of treatment and any cost associated with treatments that may be required.

9. Penalties for violations.

Adopted by the National Plant Board
August 1969
Glouster, Ohio

APPENDIX III—GUIDELINES FOR INITIATING AND DISCONTINUING STATE-FEDERAL PLANT PROTECTION PROGRAMS

1. Definition. Plant pest control means (in this instrument) the employment of a publicly supported program to eradicate, retard the spread of, or to reduce the level of loss resultant from a plant pest.

(a) Eradication means the complete removal of a plant pest from a given area.

(b) Plant pest means a living organism which damages, or is capable of damaging, desirable vegetation and may include insects, mites, other invertebrate and vertebrate animals, viruses, bacteria, fungi, and other plants not to exclude seed plants. (An organism not commonly considered a pest may, under certain conditions become damaging, and may then be designated a pest by appropriate authority.)

2. Basic in Logic. Since the measures required to implement a pest control program usually involve treatment of private and public property for the benefit of wider interests or the public welfare, they could not be undertaken by private individuals or groups, and therefore to resort to procedures under public authority is logical.

3. Necessity. The necessity for a publicly supported program for control of a plant pest rests on the following fundamental prerequisites:

(a) The pest concerned must be of such nature as to seriously threaten substantial interests.

(b) The benefits expected must outweigh the cost of the control program.

(c) The program must offer promise of being both biologically and technically feasible.

(d) In calculating the cost-benefit relationship of a program, significant adverse effects on nontarget organisms or on the environment will be included in the evaluation.

(e) If the pest under consideration is of less than general distribution, control and eradication efforts should be supported by appropriate quarantines, unless the pest is deemed not to be susceptible to quarantine management.

(f) Any pest control program shall be supported by an active research program except in emergency instances in which case a research program must be established without delay.

4. Analytical Evaluation. A pest control program shall be subjected to continuous study and reevaluation in the light of current research and of other information acquired during the program's operations. In a control program,

whenever such reevaluation indicates the feasibility of eradication of the pest species, immediate attention should be given to the redirection of such a program toward the goal of eradication.

5. Public Cooperation. In any control program, the active cooperation of the general public must be sought and maintained.

6. Cooperative Management. The cooperating agencies shall be equal partners in any pest control program and no unilateral action on the part of any one of the partners, which would materially affect the program, should be taken without prior consultations with the other partners in the cooperative endeavor.

7. Termination. Whenever the study and reevaluations, called for above, indicate that the ends of the program cannot be met or that the anticipated cost-benefit equation has shifted materially so that the expected benefits no longer outweigh the cost, the program should be promptly terminated.

Adopted by the National Plant Board
August 1972
Miami, Florida

APPENDIX IV—GUIDELINES FOR INITIATING AND DISCONTINUING STATE-FEDERAL PLANT PROTECTION PROGRAMS

Introduction

The Principles of Plant Quarantines, developed and adopted by the National Plant Board, 1931, with slight revision in 1936, have provided a sound basis for the initiation of quarantine action. It is generally agreed that if quarantine action is desirable to protect a substantial portion of the United States, joint Federal-State quarantines are preferable to individual State(s) action. Definitions and guidelines supplemental to the Principles of Plant Quarantine adopted by the Plant Boards in 1969 have been helpful in providing for uniform quarantine action.

State and Federal officials have agreed that specific guidelines are needed to enter into new essential programs and discontinue those programs no longer deemed necessary. It is necessary to develop step-by-step procedures to meet these objectives.

The National Plant Board has formed an Advisory Council (NPBAC) to periodically review plant pest problems, programs, and contemplated actions. The Council is advisory to Plant Protection and Quarantine Programs (PPQ), as well as to the regional and National Plant Boards. A consensus by NPBAC and/or States will be the basis for an appropriate course of action.

The Council is assisted in these reviews by knowledgeable individuals representing Federal and State research, extension, and regulatory, and the industries affected by these plant pest activities. The individuals selected are experts in the particular problem area classified according to crops (e.g., forests, fruits and vegetables, cereal and forage, etc.). They are asked to participate only in those NPBAC meetings when a review is scheduled for the particular crop.

Categories of Plant Pests

To facilitate planning, three categories of plant pests have been established by PPQ. Pests in these categories will be subject to continuing review and adjustment in cooperation with State officials.

CATEGORY A: PLANT PESTS OF KNOWN ECONOMIC IMPORTANCE NOT PRESENT IN or NOT WIDELY DISTRIBUTED WITHIN THE UNITED STATES. A list of such pests and a recommended course of action to be followed against each pest in this category will be prepared by PPQ and reviewed with State officials. Because of their known importance, these pests would be subject to some form of immediate cooperative State/Federal action.

CATEGORY B: PLANT PESTS OF UNKNOWN OR QUESTIONABLE ECONOMIC IMPORTANCE NOT PRESENT IN or NOT WIDELY DISTRIBUTED WITHIN THE UNITED STATES WHICH MAY BE AMENABLE TO COOPERATIVE STATE/FEDERAL ACTION. Pests not known to occur in the United States would be evaluated when initially recorded as established in

the United States. Pests presently within the United States but of limited distribution would be evaluated or reevaluated as the need arises. Pests lists would not be compiled in Category B.

CATEGORY C: PLANT PESTS OF ECONOMIC SIGNIFICANCE WIDELY DISTRIBUTED WITHIN THEIR ECOLOGICAL RANGE IN THE UNITED STATES. Pests of a type that cooperative Federal/State action may be desirable if efforts by individual growers will not provide adequate control. Also included are those pests where cooperative State/Federal efforts may be desirable to provide effective pest management because of the type of control techniques to be applied, e.g., mass rearing and release of parasites and predators; use of pheromones; and use of sterile male principle. A list of pests in this category will not be developed.

Steps for Initiating Federal-State Pest Programs

1. Federal and/or State personnel should immediately report plant pest outbreaks or new discoveries to PPQ headquarters. The report should include tentative identification, identifier, location, and other pertinent information.

2. PPQ will arrange for identification confirmation.

3. PPQ, in cooperation with affected State(s), will evaluate new pest discoveries and make a determination whether the findings represent an established infestation.

4. The pests will be categorized.

- a. Category A Pests:

- (1) PPQ, in cooperation with the State(s), will initiate the previously agreed upon course of action.

- (2) If a course of action has not been developed, immediate steps will be taken to prepare one with advice from the NPBAC.

- b. Category B Pests:

- (1) PPQ, in consultation with the New Pest Work Group and the NPBAC, will initiate a pest potential evaluation to determine the appropriate course of action.

- (2) All States will be informed of the recommended course of action and, as appropriate, action will be initiated with the affected State(s).

- c. Category C Pests:

- (1) If the pest outbreak is one for which previous action programs have been developed, e.g., grasshoppers, PPQ and the State(s) will determine the action to be initiated for the particular outbreak.

(2) If previous programs have not been conducted, PPQ, in consultation with the State(s) and/or the NPBAC, will determine whether a cooperative State-Federal program is appropriate and the course of action to be initiated.

5. All State regulatory officials will be informed of Category A and B pest situations. Notification also will be made of Category C pest situations to appropriate State offices.

6. All State regulatory officials, industry representatives, and others who may be concerned with the particular program will be advised by PPQ of recommended action agreed upon by PPQ and NPBAC. Followup reviews at regional Plant Board meetings will be accomplished as appropriate.

Steps for Withdrawing from Federal-State Programs

1. Pest Eradicated:

a. Review with NPBAC and determine proposed date for discontinuing cooperative action.

b. All State regulatory officials, industry representatives, and others who may be concerned with the particular program will be advised by PPQ of recommended action agreed upon by PPQ and NPBAC.

2. Pest Believed to be Adequately Managed, or Reached Major Ecological Limits, or Rapid Spread Continues in Spite of Regulatory Action, or Cost of Program May Outweigh Benefits, or Due to Some Other Factors, Cannot Attain Program Objective:

a. Scientific study and analysis of a pest program will be made by PPQ independently or in cooperation with Plant Boards and/or NPBAC to develop a factual report (1 year maximum). This must include a scientifically based (not opinions) evaluation of the cost benefits and economics involved.

b. Review technical report with NPBAC. Following agreement, notify all State officials of anticipated action. Indicate in notice that the proposal had been reviewed with NPBAC.

c. Based on State responses, submit summaries of State comments to all State officials.

d. If jointly (Federal-State) determined appropriate, discuss program proposal at regional Plant Board meetings. Among items to be thoroughly considered in such a review are: (1) Economic impact (cost-benefit relationship) of withdrawal from program, (2) likelihood of continuing action on program by certain States and the number considering such action, (3) action contemplated by foreign countries--particularly as it relates to restrictions on product movement, (4) an analysis of adequacy of technical review-opinions, or based on scientific approach, e.g. bioclimatic studies, and (5) ability of any concerned States to continue action.

e. If after following step 2, a through d, the consensus is that the program be discontinued, provision will be made to withdraw within a time frame which will allow orderly adjustment (usually 6 months minimum to 1 year, depending on timing of agreement in relation to fiscal year).

f. Industry and congressional representatives will be informed of agreed upon action by PPQ with indication it was jointly recommended by State, Federal, and industry officials.

g. State regulatory officials would also advise congressional representatives of the agreement reached.

3. Federal Funds Not Appropriated:

If procedures under 2 above are properly followed, and State, Federal, and industry authorities work closely together, it is unlikely that Federal funds will be withdrawn on short notice. Should this occur, however, there is no alternative other than discontinuing Federal participation with appropriate notification to all State officials and affected industries and others concerned.

Cooperation with Canada and Mexico and Notification of Other Countries

1. Our cooperators in Canada and Mexico will be kept adequately informed and their advice and counsel requested regarding:

a. The categorization of pest species.

b. Contemplated actions to initiate or discontinue programs.

2. The requests of cooperators in Canada and Mexico made to protect their interests will be followed to the fullest extent possible in keeping with agreed upon procedures and available funds. Every effort will be made to avoid taking any unilateral action. We would expect the same consideration from our Mexican and Canadian cooperators.

3. Our cooperators in Canada and Mexico and other countries will be informed of final decisions promptly.

USDA:APHIS:PPQ
March 12, 1973

APPENDIX V--STRATEGIES OF PLANT PROTECTION

The strategies for plant pest control depend upon the successful blending of many skills. Rarely does any one single method prove successful for a sustained period of time unless supporting measures are soundly conceived. There are four basic strategies for protecting plants from pests:

1. Prevention of entry.
2. Eradication of infestation.
3. Retardation of spread.
4. Mitigation of losses.

These strategies are evolutionary in concept and in practice one is gradually replaced by the next.

Prevention of Entry

Because it is not possible to inspect every piece of cargo for the presence of a pest, and even if every piece of cargo were inspected, it would not be possible to detect every pest. Therefore, given sufficient time, most pests will eventually gain entry and become established. Quarantine operations only delay this eventual entry by reducing the number of pests that enter, thereby reducing the likelihood of a pest becoming established.

Eradication

For newly established pests, eradication is often the most preferred strategy, for it is often thought that eradication requires no additional inputs and that benefits accrue forever. According to this reasoning, multiple benefits could be claimed from multiple eradication. However, reintroduction and re-establishment is always possible, and efforts to maintain the desired pest-free status must continue.

Eradication depends heavily upon early detection and sufficient technology. If the pest is not detected before it has become firmly established, eradication may not be economically justifiable or technically feasible. On the other hand, new technology may make eradication of a pest that has become well established and widely distributed, technically feasible and economically justifiable. Each pest situation requires a careful and critical analysis of the available information before eradication can be considered a meaningful objective. From an economic perspective, eradication may not be the most desirable strategy, especially when reestablishment of the pest is likely.

Prepared by R. J. Daum, Ph.d., Staff Specialist, Plant Protection and Quarantine Programs, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, July 1973.

Retardation of Spread

Retardation of spread only postpones losses that would otherwise occur on the uninfested portion of the pest's ecological range. Thus, retarding spread of a pest purchases the time needed to develop the technology either for eradicating or for living with the pest. Retardation of spread can be achieved through (1) domestic quarantines to prevent, insofar as technically feasible, long-distance artificial spread and (2) through population suppression to retard natural spread. Population suppression strengthens quarantines by reducing the number of pests challenging the quarantine barriers.

Retardation of spread is sometimes undertaken with the implicit assumption that eradication will begin as soon as technology has been developed. This may be a dilemma, for if insufficient resources are allotted to research, it may never be known if eradication would be technically possible, and if insufficient resources are allotted to retarding spread, eradication may not be economically feasible.

Mitigation of Losses

Mitigation of losses is any purposeful activity that will prevent all or any portion of potential losses from becoming a reality. Mitigation of losses may take many forms, ranging from a minor change in a spray schedule to the development and integration of a number of cultural or pest control techniques. A new plant pest may require radical changes in extant cultural and pest control practices if catastrophic losses are to be prevented. In this phase, emphasis shifts from consideration of a pest per se to the consideration of the entire host plant-pest complex; for seldom can a pest be dealt with in isolation.

A new plant pest, upon establishment in a new area, may cause emphasis to shift from an existing plant pest, which may be regarded as the major pest of the host crop, to the new pest; such as occurs when the pink bollworm invades new territory already infested with the boll weevil. Changes in extant cultural and pest control practices are often extremely complex; requiring integrating newly developed methods for controlling the new pests with existing pest control methods which have evolved over many years. In such situations, the interrelationships among the plant pest and host crops must be revealed through research to permit prescribed sound changes in extant cultural and pest control practices. Unsound practices can be disastrous, and much time and money are frequently needed to achieve pest management systems that permits living with the new and the old plant pests simultaneously.

Benefits and Costs

Plant protection must be considered in relation to the basic goals of individuals and services, aesthetic satisfaction, opportunity for recreation, and stability of existence. Plant protection will produce benefits and involve costs in terms of these goals. The benefits of plant protection are the gains in material goods and services, better health, more leisure time, or some other functional goal. If the pest threatens to reduce man's well being, benefits will take the form of losses prevented rather than gains obtained.

The costs of plant protection are the things that must be sacrificed to obtain the benefits. The costs of plant protection can usually be expressed in terms of effects on the same basic goals as the benefits. The benefits may be gains toward some goals while costs may be sacrifices in gains toward the same or some other goal. In either situation plant protection will produce conflicts in goals. The problem in evaluating plant protection is to determine if there will be a net gain or loss in terms of the relevant fundamental goals.

Normally, the benefits of a plant protection program are the losses prevented and the costs are expenditures to prevent these losses. Often, it is necessary to conduct plant protection operations in areas where the pest has little economic impact to protect other areas where the pest, if it were allowed to spread, would have a definite economic impact. The ultimate beneficiaries of any plant protection program are the general public who benefits from an adequate supply of food and fiber. Seldom do the benefits from a plant protection program accrue in direct proportion to the cost borne by the individual beneficiaries. Neither do the benefits of a plant protection program accrue to and reside with a single homogeneous group. Therefore, most plant protection programs are paid for with general tax revenues and managed by public organizations to achieve commensurate representation of the beneficiaries and to simultaneously achieve utilization of appropriate science and technology. In the simplest situation, additional plant protection will be purchased as long as benefits exceed costs. When both benefits and costs are expressed in terms of basic human goals, the comparison of benefits and costs ceases to be simple, for there is no common value unit, such as dollars. In the real world, the resources allocated to a plant protection program are often decided politically with advice from experts.

Requisites of Publicly Sponsored Plant Protection Programs

The minimum requisites for undertaking a publicly sponsored plant protection program are:

1. The economic impact of the plant pest has been established.
2. The technology for achieving the program objective is available or can be developed.
3. The benefits resulting from the program exceed the cost of the program.
4. The program offers a service beyond the capabilities of the beneficiaries or that cannot be obtained elsewhere or some other way at a lesser cost.

